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The Role and Reactions of the Municipalities
of the Red River Valley During the Flood of 1997

*A Report to the International Red River Basin Task Force
of the International Joint Commission*

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TABLE OF CONTENT

I.	THE BACKGROUND.....	1
II.	DESCRIPTION OF THE RURAL MUNICIPALITIES: AREA AND POPULATION.....	2
	1. Organizational Structure of the Municipalities.....	3
III.	THE RESEARCH METHODOLOGY.....	4
	1. Focus Groups.....	5
	2. The Questionnaire Survey.....	5
	3. Debriefing Session for the Senior Officers of the Rural Municipalities and Towns of the Red River Valley -Morris, November 24, 1997.....	7
	4. The Perspective of the Manitoba Emergency Management Organization-Meeting of November 27, 1997.....	7
IV.	OBSERVATIONS.....	7
	1. Observations From the Focus Groups.....	7
	2. Observations From the Questionnaires.....	22
	3. Debriefing Session for the Senior Officers of the Rural Municipalities and Towns of the Red River Valley- Morris, November 24, 1997.....	25
	4. Meeting with Members of the Manitoba Emergency Management Organization November 27, 1997.....	31
V.	CONCLUSIONS AND RECOMMENDATIONS.....	34
	1. Caveats on the Methodology.....	35
	2. The Role of Leadership.....	35
	3. Reactions Compared to Best Practices.....	36
	4. System Issues.....	43
VI.	REFERENCES.....	47

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I. THE BACKGROUND.

The Province of Manitoba has adopted a hierarchical distributed management system to combat emergencies. The responsibility for coordinating this system lies with the Manitoba Emergency Management Organization (MEMO) and MEMO's ability to react to an emergency is shaped and limited by the Manitoba Emergency Plan.

According to the Plan, the magnitude of the reaction to an emergency is proportional to the magnitude of the event. Rural municipalities have the initial responsibility to deal with a situation. If a municipality lacks the needed resources, assistance from neighbouring municipalities is to be sought. If this proves to be insufficient, provincial assistance, and, if need be, federal assistance, can be requested. The 1997 flood in the Red River Valley taxed the Plan - all levels of assistance were invoked resulting in the rapid mobilization of large numbers of individuals throughout the valley.

The rural municipalities have the initial responsibility for preparation for, reacting to, and recovering from an emergency like the flood. Their ability to do so rests with the abilities of local emergency management team, their plans, the resources available to them, and the quality of the information that they generate and receive. Consequently, the municipalities are a crucial link in the overall effectiveness of the Plan. Their capabilities and understanding of the situation can enhance or create difficulties for coordinating activities across municipality boundaries.

The International Joint Commission's Task Force on the Red River Valley flooding commissioned a review of the role and reactions of the municipalities of the Red River Valley during the Flood of 1997. The aim of this report was to identify the institutional and structural strengths and weaknesses of the Rural Municipalities (RMs) that experienced a severe disaster due to this year's flood, as viewed by the principal officials of the RMs. The report recommends some policy changes which would give RMs greater capacity to perform efficiently and capably in times of emergencies. The writers have made every effort to present their findings as objectively as possible. The critical comments in this report reflect the opinions and perceptions of those who participated in the assessment process. The format of the report is as follows: First, the context in which the RMs operate during an emergency is described. Second, a description of the RMs is provided. This is followed by an statement of the methodology employed and the observations that resulted from the use of the methods. The final section interprets the observation and provides recommendations based on the interpretation.

¹ We gratefully acknowledge the able assistance of Mr. John Collins with data gathering and technical matters, Dr. Ansari Khan with statistical issues, and Dr. Jerry Buckland with focus group interviews.

II. DESCRIPTION OF THE RURAL MUNICIPALITIES: AREA AND POPULATION.

Between Winnipeg and the American border, there are eight Rural Municipalities on the floodplain (RMs of Franklin, Montcalm, Morris, Rhineland, Macdonald, De Salaberry, and Richot) that were partly or fully affected by the flood of 1997. There are six towns that were affected as well (Emerson, Dominion City, Morris, Ste Agathe, Ste Adolphe, and Niverville) and a First Nations Reserve (Roseau River). The Red River borders or runs through five RMs (Roseau River Indian Reserve, RMs of Franklin, Montcalm, Morris and Richot). The river separates Franklin and Montcalm in its southern part within Manitoba. Two significant north-south transportation arteries run through the floodplain - a railway and highway 75. Eight of the Rural Municipalities, including the Roseau River Indian Reserve were fully or partially flooded in 1997 (see Map 1).

Table 1 shows the magnitude of the flood effects and the population distribution in the municipalities under study. The impact of the 1997 flood varies widely from a low of six percent of land area flooded in Rhineland, to a high of 91 percent in the municipality of Richot. An average of 43 percent of the land area of the RMs was flooded. In the flooded area of Richot, half of the houses (about 800) have been damaged.

The municipalities in the present study have an average population density of five persons per square kilometre. The RM of Richot contains the highest density of 15, while Franklin has the lowest density- two persons per square Kilometre. The Roseau River Indian Reserve is a unique community in the valley because it is a federal Indian Reservation. It contains 1,600 people in a land area of 31 square Kilometre, giving a population density of 51 persons per square Kilometre. The combined municipalities have a total population of 24,002 in a land area of 5,431 square Kilometres. A variation in population distribution is noticeable, Montcalm and Franklin have the lowest number with 1,606 and 1651 respectively compared to 5146 in Richot, 4150 in Rhineland, and more than 2800 in each of the remaining RMs (Table 1.). The population of the Municipality of Richot is mostly concentrated in its northern part - in places like Grande Point and Ste. Adolphe. Many residents in the northern part of Richot commute daily to work in Winnipeg. Hence, this area may be called a suburb or bedroom community of the City of Winnipeg.

The economy of the Red River Valley is predominantly agriculture-based. Besides farming, a small number of large industries are located in the Red River Valley (e.g., Westfield Ltd in Rosenort, Roy Legumeax Inc. in St. Jean Baptiste). Each of the high density villages, locally known as towns, such as Rosenort, Letellier, St. Adolphe, Ste. Agathe, are protected from flooding by ring dikes

There is a certain complexity in designating places in Manitoba. For example, Niverville with a population of more than 1,500 is designated a village. So are Ste. Adolphe and Ste. Agathe, while Emerson is designated a town, although it has only 721 people. Arguably, Altona and Morris are the most important population centres in the Valley. Altona was not directly affected by flooding, whereas Morris, situated at the confluence of the Morris and Red River, was affected. Altona in Rhineland has a population of more than 3,000. This town is perhaps the second most important town after Winkler in the rural south. Land area of Altona is smaller (3.58 sq KM) compared to Morris (5.83 sq KM) but has almost four times

the population density (854 versus 279). Interestingly, the village of Niverville has the highest concentration of people - 901 per square Kilometre.

1. Organizational Structure of the Municipalities.

The administrative structure of the rural municipalities consists of a body of elected councillors and reeves (Table 2.). There is a manager in each of the RMs variously called as administrator, chief administrative officer, or chief executive officer. In some of the RMs, this appointed manager acted as the emergency coordinator during the 1997 Flood. There are a number of committees and sub-committees with various responsibilities, such as, social services, planning, health-care, education, utilities etc.

Table 1: Population Distribution and Percentage of Area Flooded in 1997 in the Eight RMs

RMs	Population ¹ (1991)	Population Density per sq. Km	Area in Square Kilometres ¹	Area Flooded as % of Total Area ²	Number of Private Dwellings ¹	Number of Houses Affected ³
De Salaberry	2,985	5	647.73	20	845	50
Franklin	1,651	2	916.54	23	645	30
Macdonald	3,999	4	1,106.0	27	1,245	22
Montcalm	1,606	4	448.65	73	510	100
Morris	2,865	3	1,015.0	61	885	150
Rhineland	4,150	4	923.62	6	1,085	32
Richot	5,146	15	336.62	91	1,575	800
Roseau River	1,600	51	31.2	na	na	na
Total	24002		5,425.36		6,790	1,184
Mean	3000.25	11	678.17	43	970	169.1
Town of Morris	1,616	279	5.8		620	

Notes:

na=not available

1. Statistics Canada (1992): Profile of Census Divisions and Subdivisions in Manitoba, Part A-1991

2. Percentages of area flooded are approximates, calculated from the map produced by Water Resources division of the Manitoba Natural Resources (see Map 2)

3. Reported by the RM Administration

Table 2: Organizational Structure of Rural Municipalities

RM	Number of Councillors	Number of Permanent Staff	Number of Temporary Staff	Staff Hired for Flood Operations	Number of Committees	Number of EPC ¹ Members
De Salaberry	7	na	na	1	na	na
Franklin	7	6	10	na	5	6
Macdonald	8	19	3	5	28	3
Montcalm	7	4	5	6	25	12
Morris	7	3	0	0	na	10
Rhineland	6	6	3	4	4	5
Richot	5	8	4	20	5	6
Roseau R.	5	na	na	na	na	6

Notes:

na=not available

1. EPC=Emergency Planning Committee

III. THE RESEARCH METHODOLOGY.

The main objective of the study was to assess the role and reactions of the decision-makers in rural municipal government in the Red River Valley. There are eight Rural Municipalities (RMs), including an Indian Reserve for the Anishinabe First Nation, that were partly or fully affected by the flood of 1997. Consequently, the eight councils and a ring diked town (Morris) were selected for the study. The participants were the executives and decision-makers of the local governments and included the Reeves, Chiefs and Mayors, the Councillors, and the Manager. With the exception of the municipal manager position, these positions are filled by elected representatives from the communities of a municipality. In most cases, the manager of a municipality acted as emergency coordinator during the 1997 Flood.

This report is based on the following methods of data gathering:

1. Focus Group Discussions,
2. Questionnaire Survey,
3. Debriefing session,
4. Interview with MEMO staff.

Two general procedures were followed in all interviews (focus groups, debriefing session, MEMO interview). First, topics were not primed by issues raised in earlier interviews. Second, topics explored under the themes identified for the interview were selected by the participants. The advantage of these procedures is that they allow the participants to identify their priorities and concerns. The disadvantage is that there is likely to be less commonality in the topics identified.

1. Focus Groups.

Three focus group discussions were organized. The first one took place in Rosenort (RM of Morris) on August 8, 1997; the second in St. Jean Baptiste (RM of Montcalm) on August 27, 1997; and, the third one with Anishinabe First Nations' Band Council in Roseau River Indian Reserve on November 6, 1997. The people engaged in the group discussions were involved in some capacity with the RMs Emergency Response Team. Their positions on the Emergency Response Team ranged from Evacuee Inquiry and Registration coordinator (EIR) to the coordinator of the Emergency Operations Centre (EOC). The participants were identified with the help of the Reeves or Administrators and included Reeves, administrators, Councillors, fire fighters, volunteer coordinators, EIR personnel, and emergency coordinators. The size of the focus group varied. There were six people in the group held in Rosenort, five in St. Jean Baptiste, and five in the Roseau River Indian Reserve. The general format for the discussions was based on the following points of interests:

1. What did you do well, in managing the 1997 Flood?
2. What went wrong or could be improved?
3. What needs to be changed (planning for the future)?
4. What resources did you have, and what do you need for meeting future flood emergencies?

The direction of the discussions was established by the participants. Discussions were noted in the field books and also were audio taped by two researchers. The discussion with the focus group in Roseau River was recorded in field books. The above methods generated a wealth of qualitative data.

2. The Questionnaire Survey.

A field survey was conducted in order to augment the qualitative information obtained from the focus groups. All Reeves, Councillors, Administrators or Emergency Coordinators of the RMs of Richot, Montcalm, Franklin, De Salaberry, Macdonald, Morris, Rhineland, Anishinabe Band Council in The Roseau River Indian Reserve, and the Town of Morris were the target of this survey (see Table 3 for the distribution for each RM).

The purpose of the questionnaire was to elicit information from the emergency managers and

the executives of the rural municipalities regarding their perception of, and awareness and preparedness for emergencies arising from natural hazards, such as flooding. The questionnaire also addressed the attitude of the municipal government towards public policies and response to this year's flood.

The questionnaire was divided into 3 sections. The sections addressed the following issues:

- Preventive measures taken at the Provincial and local level,
- Emergency planning, training and education,
- Experience with natural hazards.

A total of 66 semi-structured questionnaires were distributed. A cover letter was attached to the questionnaire explaining the purpose of the survey. The questionnaire was distributed in the Month of August 1997, and follow-up visits and phone calls were made in September, October and November, 1997. As of November 28, 1997, a total of 22 questionnaires had been returned.

Table 3: Selection of Respondents for the Questionnaire Survey

RMs	Number of Questionnaires Distributed		
	Reeve/Mayor/Chief	Councillors	RMs Manager or Emergency Coordinator
1. Roseau River	1	4	2
2. De Salaberry	1	6	0
3. Franklin	1	6	1
4. Macdonald	1	7	1
5. Montcalm	1	6	1
6. Morris	1	6	0
7. Rhineland	1	5	0
8. Richot	1	4	1
9. Town of Morris	1	6	1
Total	9	50	7
Grand Total		66	

3. Debriefing Session for the Senior Officers of the Rural Municipalities and Towns of the Red River Valley -Morris, November 24, 1997.

The debriefing session resulted from a hallway conversation during the Canadian Water Resources Association meetings in late October. One of the Reeves in attendance was irritated that the problems of the upper valley were neither articulated nor addressed in that forum or in any other forum. No one had examined the experiences that the people of the valley had endured. It was suggested that such a discussion could originate in the valley. Other Reeves in attendance thought this was a good idea, so a meeting was scheduled for Morris on November 24, 1997.

Reeves, deputy Reeves or Councillors, and the senior administrative officer of the RMs of Franklin, Rhineland, De Salaberry, Montcalm, Morris, Macdonald, Tache and Richot, and the mayors, deputy Mayors or Councillors, and senior administrative officers of the Towns of Emerson, Morris and Niverville were invited to attend. Twenty-seven invitees participated in the meeting.

After an introductory session, which described the process to be followed in the meeting, the participants were divided into three breakout groups: Reeves and Mayors; deputy Reeves, deputy Mayors and councillors; and senior administrative officers. Each group had a facilitator. Each group had the same task: identify what went well during the emergency and what needs to be improved. At the conclusion of the breakout session, a plenary session was held in which the themes of the breakout session were highlighted. A general discussion of future directions followed. The conclusions of the breakout sessions are included in the present report.

4. The Perspective of the Manitoba Emergency Management Organization- Meeting of November 27, 1997.

The Manitoba Emergency Management Organization (MEMO) is charged with coordinating emergency operations for the province. In this role it interacts with the municipalities to assist with resource allocation, strategies, and response and recovery needs. Consequently, members of MEMO have an experiential basis to provide perspectives on the flood-related activities of the RMs that is external to the RMs.

MEMO was approached and agreed to a meeting in which several members of MEMO who participated in the emergency would share their perspectives. Two general themes were explored: first, what went well for the RMs and second, what did not go well for them.

IV OBSERVATIONS.

1. Observations From the Focus Groups.

The observations from the focus groups are presented in the order in which the sessions

occurred: Rosenort, St. Jean Baptiste, and the Roseau River Indian Reserve. In each subsection, the comments have been reorganized to follow the temporal pattern associated with disaster management: community readiness, community preparedness, community response, and community recovery. Subtitles under these headings reflect topics of interest for the particular focus group.

1.1 Focus Group I: Rosenort, Rural Municipality of Morris - August 8, 1997.

1.1.1 Community Readiness.

Members of the community have a long history with floods. Active memories date to the flood of 1950, and all those that followed. The recorded history goes back to the settlement of the area by the Mennonites in the 1880s. One participant's grandfather had noted that when they arrived, the aboriginals in the area were surprised that the newcomers settled on the flood plain, a location they had abandoned as a result of being surprised by a great flood. The clear expectation was that more great floods would follow.

The flood of 1996 was a learning experience for many members of the community. Outside the ring dike, many home owners went through the process of protecting their property against high waters and engaging in a complex project management process of: translating predicted water level into height of the needed dike; estimating and obtaining the materials needed to construct their dike; marshalling the manpower needed to construct a structure in the time available; and then, maintaining the protective wall that was built. In addition, lessons learned from 1996, were being incorporated into the planning for 1997. For example, in 1996 many families boarded their children at schools outside the flood plain. The separation of children and mothers was often problematic for both. Consequently, many families planned, and subsequently endeavoured, to keep their family together for as long as possible during the impending emergency.

Individual readiness to respond appropriately to forecasts varied considerably. While most people engaged in precautionary measures, there were exceptions. People reported being frozen into inactivity - not knowing where to start; others exercised strong denial tendencies; and, still others wanted to be more certain of the threat before altering their landscapes. No recognizable gender differences were identified. Differences in reactions were attributed to differences in psychological profiles. The first group seemed to respond well to friends and relatives who would get them started. Once started they were able to take control of the tasks that needed to be completed. But the other two groups showed greater resistance to beginning. Even after the flooding of Grand Forks, an event that galvanized many, some people waited, comfortable with the knowledge that Grand Forks had flooded before, and the subsequent effects in their region were not too severe. The consequence, for many in this group, was the inability to mount an effective defense against the water levels that resulted.

1.1.2 Community Preparedness.

The Rural Municipality established an Emergency Operations Centre (EOC) at the fire hall within the ring dike at Morris. The Emergency Planning Committee (EPC) coordinated community preparedness and response for the emergency from the EOC.

Preparations for the flood, both for individuals and the Municipality, were greatly hindered by the April blizzard. Resources had to be shifted to respond to the problems caused by the blizzard. A crucial requirement was to remove snow so that dikes could be

constructed on solid ground. Having to engage in such activities shortened the time available to prepare flood defenses.

Forecasts of Water Levels for the Community.

Knowledge of the expected flood levels was crucial to the ability of the EPC to advise residents on the resources they would require. That the forecasts kept increasing caused difficulties in coordinating resources, particularly after road access was lost in some regions early in the emergency. Trying to keep up with increasing forecasts, meant a second problem was not being properly addressed. The flood plain is broad in the RM. Consequently, wind action alters water levels, by as much as a foot in some areas. Moreover, the winds cause waves that push peak water heights considerably higher. Building to the forecasted level plus two feet was inadequate for some residents.

Wave action was viewed by participants as a serious problem. Four to five foot waves were reported. It was noted that wave action was a much greater problem in 1950 when eight to nine foot waves were noted. The difference in wave actions was attributed to the absence of rural roads in 1950. It was thought that the present east-west road system, about one every mile, served as an energy absorber that reduced the wind's impact.

Participants noted that previous floods, like the present one, had been preceded by large spring snow falls. Their concern was that land use practices in the American part of the valley were designed to remove water rapidly from farm land and therefore were intensifying the flooding in the RM. They noted with regret that similar practices were occurring in Manitoba. This water should be slowed down when there is a potential for a flood.

Dike Construction.

To assist residents in constructing dikes, the EPC prepared pamphlets on proper dike construction techniques. These were readily available at the fire hall. The pamphlets were well received with people reporting that they were clear and easy to follow. In addition, members of the Rural Municipal Council demonstrate proper construction techniques at various locations in the municipality. The sense was that the residents mastered the techniques, but many volunteers did not. More than one dike built by volunteers had to be disassembled and reconstructed.

Distribution of Materials.

The strategy for distributing sand and sandbags varied among the major communities in the municipality. The Morris area is inundated early and many roads become impassable. Consequently, the strategy was to move sand and bags to residents outside the ring dikes as early as possible. In many cases, excess sand and bags were obtained for contingencies that might arise after the home became isolated. On the other hand, in Rosenort it was more efficient to centralize the filling of sandbags and then move the bags and work crews, when available, to locations of high priority.

Sand and sandbag deliveries were critical variables for people. Their demand for materials and sometimes stressed the system. When delivery men were informed that a load was no longer needed, they were directed to the nearest site in need, often by people in the area, rather than to the site of greatest need. Nonetheless, sand bags generally got to where they were needed in time.

Distribution of Volunteers.

The EPC's response plan called for volunteers to report to the fire hall for assignment to the most urgent needs in the municipality. This did not happen. Only 40 to 50% of the volunteers did so. This, in part, reflected how volunteers were raised. Many residents arranged for the assistance of friends and relatives. This was perceived by many as a way of providing some quality assurance to the work being done. Too often, volunteers arrived untrained. Neophytes were laying sand bags for the first time. Time was needed to train them and greater oversight of their work was required. Some residents attempted to use volunteers only for filling and moving the bags, but quickly discovered that they were unable to sustain the physical effort needed to lay all the bags. The volunteers' intentions, attitudes, enthusiasm and willingness to work were highly praised and greatly appreciated, but there were concerns, justified or not, that volunteers do not have the same vested interest in the success of the workmanship as one's friends and relatives had.

A second cause of the low registration of volunteers at the EOC was the way in which some volunteers entered the municipality. When being transported by bus, volunteers would see work parties engaged in dike construction at residences on the main highways leading to the towns in the RM. Rather than continue to the EOC, the bus would stop and those on board would join the work in progress. As a consequence, the distribution of volunteer efforts was uneven. This was a cause of resentment among residents who did not live along major routes in the municipality.

There were two unintended consequences of such actions. First, at some sites there were too many people. This slowed the work and certainly under-used the human resources. Second, not enough people were available to the EOC for assignment. Consequently, some residents could not obtain the assistance they needed at the time they required it. This became critical as residents were isolated by rising water.

Overall, the utilization of volunteers was viewed as a significant improvement over 1979 efforts. There was far better distribution of volunteers within the RM. In 1979, the amount of volunteer activity was inversely proportional to the distance between the work site and the major communities in the municipality.

As most volunteer activity occurred in the evening, no systematic volunteer support system was used by the EOC. Residents provide refreshments at their sites.

Brunkild Dike.

The participants did not feel that the newly constructed dike at Brunkild (Z-dike) caused extra flooding in their area, but thought that it may have helped keep the water levels high for a longer period. The principle of saving 100,000 homes at the cost of a few was viewed as justifiable. Being silent about the decision and the effects it caused was not. The people who were sacrificed should be fully compensated.

1. 1. 3 Community Response.

During the response phase, the EOC faced two dissimilar management problems. The first, required maintaining the capacity to ensure the integrity of the ring dikes; the second, required servicing the residents outside the ring dikes.

In anticipation of the need to deal with damage to the ring dikes, the EPC had rented the equipment needed to perform dike maintenance. However, when the Province identified the need to construct the Z-dike south of Winnipeg, there was a strong demand that the RM's equipment be moved to assist in the construction. The EPC felt like it was battling the city for the right to protect itself and felt that their needs were not being respected because of their smaller size.

Outside the ring dikes, the preparation and response phases blended together. The rising waters isolated some homesteads during the construction of dikes. Once isolated it became increasingly difficult to move volunteers to such work sites. The EPC had small boats and some larger ones rented from Gimli. The safety of the smaller boats was a concern when the winds and waves were up. In addition, the shifts in water levels accompanying shifts in wind direction increased the hazard of navigating through the water. Given the situation, the EPC knew that it would have difficulty in servicing secondary emergencies such as health problems and fires. This would be particularly true if the site of the emergency was any distance from the ring dikes. Residents were informed of this and fortunately no events occurred.

With the arrival of the military, the aquatic capabilities of the EPC were enhanced. However, there was never any assurance that the boats would be available if needed, because the military boats could be ordered elsewhere at any time.

And finally, as the peak approached, the EPC lost control of its ability to respond effectively. Too many calls for assistance were received from outside the ring dikes; it became increasingly difficult to deliver the assistance to the sites; and too few volunteers were available to provide the assistance. At this point it was clear that an evacuation was needed in some areas and the EPC's plan was activated. Given a successful evacuation, the EOC believed that it then could manage the response activities of those who remained by using the supplies provided by the Department of Natural Resources (DNR) and advice from MEMO.

Voluntary Evacuation.

The EPC strongly agreed with the principle, found in the Province's Emergency Plan, that places the highest priority on the protection of people's lives. Therefore, the EOC recognized that evacuation might be necessary and had developed their own evacuation plan. The EOC's plan called for the evacuation of women, children, the elderly and those with health problems.

Generally there was compliance with the request to evacuate. However, there was some resistance to the order. Often it was from individuals who had been involved in fighting earlier floods (e.g., 1950) and believed they were still capable of flood fighting, despite being forty years older and having pacemakers, etc.! Diplomacy and tact generally convinced them to leave.

Mandatory Evacuation.

This was one of the few topics that generate anger during the discussion. The situation was poorly managed. The order was confusing; mixed messages were received. First, everyone was to be evacuated, but, within the hour, this order was changed. The scope of the evacuation made no sense. The order came from the province, but the authority to issue the order was with the Reeve. Yet, the order was sent out without coming through the Reeve's

office. It was noted that the order was unsigned, and unattributable, and therefore, difficult to pursue with the Province.

The situation was very frustrating. The causes of the problems were perceived to be those in charge of the RCMP, MEMO and military and their inability to agree to lines of authority. This perceived power struggle placed at jeopardy the ability of the first-responders to act in a coherent, responsible fashion.

A meeting was held with representatives from DNR, the RCMP and the Military. At the meeting it was agreed that women, children and people with health problems would be required to leave, whereas, people with boats, supplies, and a cell phone could stay. In this meeting the military and RCMP were very reasonable and accommodating. However, the agreement was overturned at a higher level. It appeared that the people at the top of these organizations were changing, and the new leaders were trying to exert their authority by issuing orders. Moreover, it appeared that the senior people wanted the authority, but not the responsibility. The Reeve asked to be relieved of the responsibility so that those issuing the orders faced the consequences of a mandatory evacuation. The request was refused. When the question of refusing the order was raised, the Reeve was informed that refusing to evacuate everyone would be interpreted as indicating they did not want help and therefore future consultations would be denied. Such coercive and inflammatory remarks set the stage for what became an unpleasant experience for many residents.

People were not frightened by the water, but were stressed by the tactics used to get them out of their homes. Some people were told a four-foot wall of water was coming at them and they had to leave immediately. Others were told to be out in ten minutes or face forcible evacuation. Parenthetically, one councillor was told by a member of the army that the army knew they could not carry out such a threat, but were using it as a tactic to facilitate the evacuation. The fear-mongering strategy was effective. But the cost was a panicked population, unable and not given enough time to make wise decisions about their orderly departure. It left many people anxiety and panic stricken.

However, the tactic also generated nonviolent civil disobedience. People did not leave. Some of these were outside the ring dikes. Where their presence in the flood area was unknown, the potential for loss of life was greatly increased.

Interactions with the Military.

The presence of the military was a new experience for the Municipality. The need for military assistance had not occurred in the recent previous floods. Overall, involvement of the military was appreciated. They arrived when people were exhausted and provide a much needed symbol of encouragement and assistance. The reaction was reciprocal.

On the other hand, the military presence was seen to have produced serious negative effects, and for some, the military contribution was a liability to the emergency response system. The concerns centred on four themes. First, the tactics used to evacuate people were considered insensitive, cruel and lacking in diplomacy. There was, particularly among senior officers, an arrogance and an inability or unwillingness, to use local expertise. Second, the military actions were inconsistent. Quite helpful in some situations, they refused assistance in others. The help was denied because contributing to a particular action was not "part of their orders." Third, the military was slow to respond to local requests and needs. All actions requested by the Municipal EPC had to be cleared through the chain of command. In some

cases, this took hours. When requests were denied, a rationale might not be given. And finally, the military was unreliable. They always seem to leave before any real dangers happened. Often the departures happened with no forewarning. Mixed messages were received that complicated community tactical response planning. For example, the military indicated that the municipality needed military resources, particularly boats, in the event that the crews protecting the ring diked communities needed to be evacuated. Military boats were available, yet, the Municipality was also told to ensure that it had sufficient boats of its own (between the rented boats and the MEMO boats, it did) for this task because the military boats might not be available.

View of the Provincial Emergency Response Plan.

Widespread dissatisfaction was expressed with how the Provincial Response Plan was deployed. The plan assigns the responsibility and authority for responding to the emergency to the Municipality. Despite assurances from the Premier that the line of authority was to be respected, too frequently, it was not. MEMO acted unilaterally, without authority, and in the minds of some unnecessarily. The most glaring example was the mandatory evacuation order which was issued without consultation with the Municipality. While preliminary discussions of the possibility were discussed, the need for, and timing of, the action was not. That military commanders in distant cities knew that their role on arriving in Manitoba would be to enforce a mandatory evacuation while those in charge of first-response capabilities were kept ignorant of the order, underscores the degree to which the hierarchical management system was malfunctioning.

Community Cooperation During the Preparation and Response Phases.

In the early phases of the emergency, there was a high degree of cooperation in the community. As the water rose this persisted within the ring dike communities. Outside the ring dikes, people focused increasingly on saving their own property. Over time, people became tired, impatient, increasingly worried about their property, even fearing that they would lose it, but they were not frightened about their own safety. This changed with the mandatory evacuation order and the tactics used to enforce it.

1. 1. 4. Community Recovery.

As the waters receded, people returned to their homes. For those suffering flood damage, this was particularly trying time. Individuals "spun their wheels," not knowing how and where to start the process of returning to normal. Some spent days just staring; others felt more exhausted than if they had worked all days. There was, and continues for some, a sense of defeat. People are not capable of making decisions, even such simple ones as which shirt to put on in the morning. These problems are not being addressed. There was a strong sense that MEMO had not prepared for reentry problems and there was little help available for many.

Of immediate concern was cleaning-up after the flood. Equipment was available. But because so many people were having difficult focusing their attention on needed activities, outside help was necessary.

Non-Government Organizations (NGOs) were quick to respond. They consulted with the EPC to identify what was needed. Optional activities were identified, and the NGO would undertake one. A great deal of consultation occurred and the Reeve focused the efforts on pressing problems.

The second major source of anger in the discussion was generated by considering the Province's recovery programs. What people needed were assistance, guidance and order. What they got was confusion, red tape, lack of consideration and chaos. Policies were changed in midstream. For example, one family, after completing the reconstruction of their basement, was told to raise it. People were told to rebuild and submit bills for reimbursement, but neither guidelines nor capital was initially made available to do so. After hearing that there would be up to \$100,000 available for replacement construction, they discovered that was not to be the case. Some people had single-item bills that were larger than the adjustments they received. One person bought pumps to defend his property, while a neighbour rented pumps, for more money than it cost to purchase the pumps, for the same purpose. Both were successful, the renter was compensated for costs, the purchaser was not. Another person spent a great deal of money to successfully protect his low-lying property. A neighbour did nothing. Only the neighbour received compensation. Possessions were depreciated, and the amount received rarely covered half the replacement cost. People reported being unable to purchase even used replacements with the amounts given to them under the program. There were reports of individuals who do not intend to try and protect their basements in future floods because they believe that people who made no attempt or who were unsuccessful in 1997 were sufficiently compensated that they are now better off financially relative to themselves. Apparent inequities abound. Vulnerable people received shabby treatment.

It was generally agreed that individuals should not profit from the flood. Depreciation on some items, like furnished basements was appropriate. But other items, such as furnaces, oven ranges, water heaters and refrigerators are necessary to return to normal living. Better formulas are needed.

1. 2 Focus Group II: St. Jean, Rural Municipality of Montcalm, August 27, 1997.

1. 2. 1 Community Readiness.

The citizens of Montcalm are familiar with flooding. Its time course and possible effects are widely known. People living outside the ring diked communities have developed the capacity and experience to defend their property against rising water. Consequently, there was no undue alarm over the prospects of a flood in 1997.

1. 2. 2 Community Preparedness.

Preparedness began with the meetings held by MEMO in Winnipeg and Morris in late February. The meetings focused on long range forecasts, both American and Canadian, that indicate the record snow loads in the upper basin were going to lead to spring flooding which had the potential to be more severe than had occurred in 1996. Information from that meeting was widely circulated in the community.

The community has an emergency committee. On the weekend of the April blizzard, the committee was scheduled to meet to identify all individuals that would be considered essential service providers in the event of an evacuation of the ring diked towns. The meeting was cancelled and not rescheduled. This was an error. It left the community without a formal response strategy and unable to inform MEMO of the names of the essential service providers and why they were needed. This weakness was subsequently exploited, in the view of participants, by MEMO during the response phase of flood fighting. In retrospect, the

community should have been better prepared to deal with MEMO.

As part of its response structure, the rural municipality had two emergency committees: one in Letellier and one in St. Jean. For both committees, the contact with MEMO was to be a single individual. When the preparedness phase progressed into the response phase, the actions and behaviours of this individual became intolerable to the community. Direct contact with MEMO in Winnipeg was required to have the person removed and an alternate assigned. The need to deal with personnel matters at this stage of the flood was not appreciated.

Outside of the ring diked communities, people's previous experiences had generally positive impacts on their preparations. Boats, pumps and gas generators were made ready; food and water supplies prepared; agricultural products removed; sandbag dikes established. People were ready to be isolated and to protect their property. However, prior experience did not always assist preparedness. Some individuals had been dry in previous floods and expected to be in this one. When representatives of the Prairie Farm Rehabilitation Association informed residents of the water levels expected² for their property, there was insufficient time to build the required defenses.

Cellular phones became an important link in the community, at times, the only reliable means of communication. The cell phones became the vital communication link and made the delivery of assistance to those outside the dikes far more efficient. Once flooding occurred, cell phones were the fastest and safest way to check the safety of people in more remote locations.

1. 2. 3 Community Response.

The community has an emergency plan placed in a binder for ready access. However, it was not used. They have found that they need to react to the situation and that each situation is sufficiently unique that the plan is not too helpful.

Voluntary Evacuation.

The EPC recognized that it would be necessary to have people, including those inside the ring dike, leave before the water rose too high. On Monday, April 21, a local state of emergency was declared and a voluntary evacuation program was activated. Part of the rationale for the approach was to get people use to the idea that they would have to go. People were strongly advised that the evacuation might become mandatory by the end of the week. On Tuesday night, members of the committee went door-to-door and provided people with a list of things to do to prepared for evacuation. The list included how to prepare homes for evacuation.

Mandatory Evacuation.

On Wednesday, April 23, the municipality received an unsigned letter from MEMO declaring a mandatory evacuation. The Reeve also sent a letter authorizing it. The EPC contacted those that had not evacuated already by phone. In addition, the fire fighters went

² Parenthetically, it was noted that the information provided by the Prairie Farm Rehabilitation Association tended to overestimate what actually happened, although some residents received underestimations. The difference between the estimate and the obtained levels led some residents to conclude the estimates were wrong. This "error" was a concern to them.

around and distributed notices. As a small town, the word spread quickly. By the 8:00 p.m. deadline specified in the evacuation notice, everyone was out. It was perceived to have gone smoothly. In general, the mandatory evacuation was viewed as a good thing. However, it would have been better had it occurred a day earlier because the roads north were still open then. As it was, a circuitous route had to be followed.

The mandatory evacuation did present some problems. First, the number of essential personnel that were allowed to remain was too low for the number of tasks that needed to be performed. The number was selected without consultation and imposed over the strenuous objections of the community. DNR was responsible for the integrity of the dikes. Yet, on the two days when high winds drove the water onto the dike, the DNR relied on the local responders to work on it. The military had a skeleton crew inside the dike. But they would not have been of much help. Additional military personnel were available for specific tasks, but they had to be requested through the military chain of command - a process that would have delayed action by several hours. Consequently, the local essential personnel knew that if a secondary emergency developed inside the dike (e.g., a fire), they would not have the manpower to deal with it. This placed enormous strain and responsibility on the shoulders of the few local essential service providers who remained and who saw their role, in part, as preserving the safety of the residences in town.

The process by which the mandatory evacuation was introduced was generally considered a disaster that caused a great deal of unnecessary anxiety and panic. Its early enforcement continued this unfortunate pattern. After the townspeople had left, those remaining as essential service were told that half of them had to leave and be inside the ring dike only during the day. This was viewed as unfair. The essential service personnel had the skills needed to provide services that might be needed. What is more important, people thought they were receiving inequitable treatment. DNR kept a crew of 19 inside the dike to operate heavy equipment if need be. However, there were only six pieces of equipment. It was never satisfactorily explained why more than six people were allowed to stay, when they clearly would not be able to work, while so many local essential service personnel were forced to leave. DNR was adamant and authoritarian about the numbers and put great pressure on the community to meet the numbers the Department specified.

Outside the ring dikes, the reaction to the mandatory evacuation and the attempts to enforce it met much greater resistance. Based on prior flood experiences, people expected that they would be fighting the flood. Preparations were made; defenses mounted. The announcement and enforcement of a mandatory evacuation were taken as a betrayal by the province. Many people resisted. Some were escorted from their property by the RCMP. Others went into hiding and refused to communicate with outsiders of any sort. They refused to respond to cell phone calls and were not visible when boats arrived to see if they were all right. Others, some of whom had been escorted from their properties, returned within an hour of leaving. While the enforced evacuation lasted only twenty-four hours before it was rescinded, the time period was sufficient for some basements to be flooded, a few homes to be lost, and several more to be at greater risk. The episode created panic and a great deal of ill-will that continues to linger.

The community had argued strenuously against an inclusive mandatory evacuation. They agreed fully with the position of the Rural Municipality of Morris that the evacuation should apply to women, children, the elderly and the infirm. People, equipped to fight, communicate and escape should be supported in their efforts, not told to abandon them. MEMO refused to listen and, for some, is responsible for the subsequent upheaval.

The initial period of the evacuation caused a lot of damage in the community. What is more important, it increased the risk of injury or death to its citizens. Those hiding and returning to their properties could not be tracked. They were taking greater risks without the community knowing of their whereabouts and hence having the ability to provide assistance to them. When personnel went looking for such people in boats, the safety of the searchers was placed at a higher risk. Both types of situations could and should have been avoided.

Interactions with the Military.

The military was "super." They helped a lot of people. It is unfortunate that they did not arrive a week earlier. If they had, it would have been possible to save several of the properties where the owners waited too long to begin constructing dikes.

On the other hand, the military was blamed for the fiasco of the enforced mandatory evacuation. The belief is that a commander in Edmonton ordered the commander in Winnipeg to order the RCMP to clear all personnel out of the valley. Stories of 4-5 foot walls of water were spread; bullying and intimidation tactics were employed. This was thought to be the goal of the meeting in Morris. Despite the objections of many local officials, the strategy was pushed. It is believed that only after the government, possibly Premier Filmon, interjected and informed the commander from Edmonton that the order needed to be changed, was the strategy altered.

Interactions with the Province.

Concern was expressed that the Province exceeded its authority during the response phase of the flood. The community was informed that when the province declares a state of emergency, then the authority to act transfers from the community to the province. The community was perturbed when it later found out that this assertion was false: the act clearly indicated that the local community continued to have the principal authority in this situation. The municipality does not think it will make the mistake of believing the government in the future.

There was further concern about how the mandatory evacuation was sold. The province attempted to enforce it, although, in the absence of a declaration of martial law, they were not entitled to do so. The community did not know that the province was acting illegally and therefore allowed the rights of its citizens to be violated.

And finally, the participants were irritated with MEMO, DNR and the military for ignoring the knowledge and advice of local experts and inhabitants. There is a wealth of experience in the community and Council could have assisted in coordinating the interaction of government departments and the relevant knowledgeable people. Yet no effort was made to do so and when advice was offered, it tended not to be believed. The consequences were actions being contemplated or attempted, or predictions made, which were nonsensical to local experts. This in turned reduced the credibility of those leading the defenses against the flood. Two examples were offered. First, the military clearly did not understand the characteristics of flooding in the valley. They were attempting to fight the Saguenay flood. The vision of a five-foot wall of water traversing the Manitoba flood plain was a cause of mirth for some. Second, DNR indicated that a certain stretch of highway 14 would flood while a parallel stretch of highway 201 would not. Residents of that area told the community that the reverse would happen. The residents were correct. Errors in predicting losses of

access routes were not considered to be trivial!

The participants could not understand why local experts were not consulted. It was clear that almost all the MEMO and military personnel placed in the community had no experience with flooding. Mutual benefits would have resulted. Local experts would not have prevented the need to evacuate, probably they would have reinforced it, but they could have prevented the evacuation from turning into a fiasco and causing emotional damage in the community.

1. 2. 4 Community Recovery.

The participants did not spend much time addressing this topic. It was noted that the community was actively cleaning up flood damage. Once this is completed, the attention will focus on seeking community input of how the flood was managed. The desire is to obtain ideas from the experts in the community about how to be more effective in responding to the next flood.

1. 3 Focus Group III: Roseau River Anishinabe First Nations - November 6, 1997.

Unique challenges faced the residents of Roseau River Anishinabe First Nations. Cultural practices, governance, and financial procedures differ from those found in the other valley communities. Consequently, there was less opportunity to benefit from experiences of other communities on the flood plain. This is unfortunate, because the residents of Roseau River Anishinabe First Nations may be the most vulnerable group living on the flood plain. Because the system under which they live controls all aspects of their lives, the community suffers from a sense of helplessness. When people feel helpless, they believe they have no control over events. Moreover, it is more difficult for them to identify a course of action and to sustain that activity once initiated (see Abramson, Metalsky & Alloy, 1989).

Considering the resources that were lacking, the participants agreed that the community did a great job in dealing with the emergency. Moreover, despite the hardships and misfortunes (one resident died of a heart attack while working on flood preparations), the community benefited in that people came closer together in order to cope with the flood.

1. 3. 1 Community Readiness.

Responsibility for First Nations people lies with the federal government through its Department of Indian Affairs. Consequently, the community did not fall under the provincial Emergency Plan. Access by the community to provincial information and services was correspondingly diminished.

The attitude of people was important in determining their reactions to flood forecasts and warnings. Some members in the community engaged in wishful thinking - believing the flood would not happen. Such attitudes kept people from taking appropriate preparatory actions. While the experiences of Grand Forks did shock some into actions, denial persisted for others. For some people, there was a strong sense of denial and this was communicated to others by such actions as driving past people filling sandbags and laughing at them.

1. 3. 2. Community Preparedness.

The community established an Emergency Operations Centre in an alcohol treatment centre. The participants indicated that a site outside the flood plain would be preferable in the future.

Assistance to the community was provided by Manitoba Association of Native Fire Fighters (MANFF). In addition, a secondment was made from the finance area to look after the finances related to flood fighting costs. MANFF works with MEMO when natural disasters occur in areas governed by the First Nations. It served as the liaison between Roseau River and MEMO. A member of MANFF joined the community in order to facilitate liaison activities. MANFF provided forecasts and flood information, and reported the community needs to MEMO.

Roseau River first hired MANFF in early 1996 to obtain assistance with that year's flood emergency. MANFF generated an emergency work plan for them at that time. In 1997, MANFF's assistance was crucial to the community's efforts. MANFF offered advice on what needed to be done and who should do it to Roseau River's flood coordinator, who was given more authority than either the chief or council during the emergency.

The interactions with MANFF were not without problems. The community felt that the information provided was inadequate at times. Communications with MANFF, which has its offices in Winnipeg, were sometimes difficult. Phones, faxes and, sometimes, personal contact were used.

Women were involved in meetings on the flood preparations. They participated fully in the discussions. Their principal concern was for the safety of their children.

1. 3. 3 Community Response.

For a smooth flood response, people need to know what to do. It is necessary for the planners to think carefully about how to implement an emergency plan. It was agreed that the community needs training in how to respond to flooding.

Mandatory Evacuation.

In 1979, the most serious previous flood, the community had been evacuated. Consequently, there was some expectation that it might happen this year. This expectation was reinforced, and communicated through the community, six weeks before the order arrived. Voluntary evacuations occurred prior to the notice of the mandatory one.

Two hours before the official notification, people were alerted to the need to evacuate. When the order came, it was communicated in person to those who remained. Many people resisted the order. Some had not prepared for it ahead of time. With such individuals, different tactics were taken. First, a concern for their well-being was expressed. The evacuation was for their safety; if the dike breached, it was possible they would be injured or would drown. Others had to be told that the police would come and remove them if they did not evacuate. Overall, everybody was stressed by the uncertainty surrounding the evacuation process. At the time of the crest, there were 30 people left to provide essential services for the dikes.

The most frustrating problems were the lack of financial and physical resources. For example, the community needed pumps. When the need was identified, the money for pumps was not available. Ultimately, they had to buy pumps. A second example was offered. The community wanted to provide food for volunteers. To do so, they had to get approval from the Department of Indian Affairs.

A second major concern focused on communication problems. The problem was the absence of prompt and complete information. The problem caused several adverse effects. First, flood-related decision-making became more difficult. Second, the finance office was moved to Winnipeg making it harder to track resources. And third, the notification of their evacuation was delayed. When Premier Filmon declared a disaster zone and stated which areas needed to be evacuated, Roseau River was not mentioned. The community had to find out from federal authorities that they should also evacuate. Roseau River always seems to be caught between jurisdictions, as they were in this case.

Where people had relatives, they went to stay with them. Often people lived at very close quarters. This caused difficulties for some.

Evacuation Location.

The evacuation location was also a concern for many members of the community. They felt like they were not treated equally or fairly. While people from other communities were housed in hotels, the residents of Roseau River were placed in an arena in St. Anne. There was no privacy, they had to sleep on air mattresses, and there were problems with the heating. People had problems cashing cheques (the community was able to resolve this problem by making arrangements with some credit unions in St. Anne). On the other hand, people relocated to St. Anne ate very well, far better than they could if they were on social welfare. The arena situation was difficult. But people dealt with it well. This showed the resilience of the people and became a source of pride.

The participants were quick to point out that the issue was the facilities and not the people of St. Anne. The citizens of St. Anne were cooperative, helpful and friendly. They tried hard to ameliorate the difficult situation that the evacuees faced.

It was pointed out by a participant that the choice of the evacuation location was made by MANFF and that this fact may not be widely recognized. MANFF was asked to find a location and identified St. Anne. The flood coordinator asked for confirmation that St. Anne has the resources needed to house the community's evacuees and received it from MANFF.

In a previous emergency, the community had been evacuated to the military facility at Portage la Prairie. Families had their own space. The community was together and isolated somewhat from outsiders. The sense was that this previous situation was less arduous on members of the community.

The perception of receiving mixed signals was raised repeatedly. MANFF, MEMO, the provincial DNR and the military were among the organizations that were perceived as sending them. The military forcefully pushed for the evacuation of the essential people who were monitoring the flood. This was not perceived to have occurred elsewhere. When members of the community went to Altona for financial help, they were refused the same treatment as other evacuees. They were told that they would have to go to Winnipeg to make

arrangements. Apparently, at some previous point in time, discussions between the federal Department of Indian Affairs and the Red Cross produced an agreement that the Altona centre would not be responsible for financial assistance for evacuees from Roseau River. Roseau River residents were not informed of this agreement, nor were they asked to participate in the discussions.

1. 3. 4 Community Recovery.

The cultural uniqueness of the Roseau River Anishinabe First Nations seems to be incompatible with the Recovery programs that were put in place. As a First Nation, the community "owns" all the buildings. Families occupy residences, but do not have ownership of them. Consequently, it was difficult for a family to get assistance in repairing the house in which they lived because programs were designed to help property owners.

In the community, there is a belief that under the Disaster Financial Agreement, the federal government unloaded its financial responsibilities to the First Nations onto the province and that the province then takes a percentage of the money. The local MLA indicated that the province has no responsibility in the situation. While the community does not think he is correct, they agree with the sentiment: the federal government should be working directly with the community.

Currently, Roseau River is working directly with MEMO on issues related to damaged homes and goods. MEMO will not give them 100% of their costs. They are only getting 80-90% of their depreciated costs. The Department of Indian Affairs is supposed to cover the shortfall.

As the waters receded, and people started to return to the community, there was concern that the difficulties experienced in interacting with authorities would continue and these stresses would be compounded by post-flood trauma. The Salvation Army offered psychological services. The Salvation Army wanted to go house-to-house to provide the service. They were advised that it would be better if an office was opened and people informed of the available services. No additional interactions occurred. A phone call was made to the Salvation Army but it not returned. Subsequent events have convinced the community that people trained in dealing with post-flood trauma are needed.

1. 3. 5 For the Future

At the end of the meeting, the participants offered suggestions as to what they needed to do to improve their ability to deal with another major flood. Some of these ideas are found in the paragraphs above. The rest are listed below.

- The community needs to clarify the roles and responsibilities of the federal government, provincial government, MEMO, the Red Cross, and Salvation Army. At present there are confusions among these. The community feels that they are being shuffled between levels of government.
- The community needs a clear plan for the financial resources for all phases of emergency operations.
- The community needs access to heavy equipment. This would include bulldozers, front-end loaders, back hoes, tractors, dump trucks, and heavy pumps.

- The community needs to complete the modifications to the dike so that it meets the new standards.

2. Observations From the Questionnaires.

2.1 Disaster Seriousness Ratings.

How serious are disasters to the executives of the rural municipalities of Red River floodplain?

All people acknowledge natural hazards are significant problems and may happen anywhere, and at any time. Whether or not a community leader will take appropriate action on the basis of such acknowledgement depends on various factors. In the minds of the community leader, other more pressing socio-economic problems may get priority. The hazard particularly may not be viewed as sufficiently serious to warrant specific measures. On the basis of such variations, there could be disagreement on what to do and how. In order to judge perception of seriousness of natural hazards, the questionnaire asked the respondents what have been the serious problems facing their community over the last ten years. Respondents were asked to rate each of 12 disaster types from a score of 1 (not serious) to 10 (most serious). Hence, the first question in the questionnaire was "We are interested in knowing what have been the serious problems facing your community over the past 10 years. Please rate each problem on the list with a score between 1 and 10 to represent just how serious you think that problem has been for your community over the past 10 years. Here is a list with a scale from 1 to 10. Think of a score of 1 as no problem at all, and a score of 10 as a most serious problem. What score between 1 and 10 would you give to..." This statement was repeated for each category of questions.

The results are shown in Table 4. As expected, flooding is seen as the most serious problem in the flood plain. Usually, one would expect that people to express higher concern for a very recent event that created severe damages to the people and community. Although the magnitude of the flood in the Red River Valley this year was a hundred-year event with a return probability of 0.01, people in the Red River Valley have recent experiences of increasingly larger floods at diminishing intervals.

Table 5 presents zero-order correlations in seriousness ratings of 12 hazards reported by the respondents. With few exceptions, the ratings are found to be strongly correlated among themselves. These relationships show underlying coherency in respondent's concerns for natural hazards that are ever present in the valley.

Table 4: Mean Seriousness Ratings of Different Hazards

Variables	Mean	Rank
Flooding	7.827	1
Severe Snowfall	6.174	2
Blizzards	5.261	3
Damage From Pests	4.091	4
Water Pollution	3.810	5
Air Pollution	3.762	6
Drought Condition	3.608	7
Hailstorm	3.500	8
Drought	3.227	9
Hazardous Material	3.190	10
Fires	2.367	11
Tornadoes	1.818	12

Table 5: Correlation Among Hazard Seriousness Ratings

	Flood	Severe Snowfall	Blizzard	Drought Condition
Flood	1.000			
Severe Snowfall	0.404	1.000		
Blizzard	0.219	0.335	1.000	
Drought Condition	0.298	0.634	0.340	1.000

2.2 Attitude Towards Public Hazard Mitigation Policies.

Assessment of attitudes towards public policy alternatives in disaster mitigation was probed in a set of five questions posed to the rural municipal executives. These questions were introduced by an statement similar to that used by Rossi, et.al (1982) in an study of America disasters:

"What is your opinion about something the provincial government could do to deal with the effects of natural disasters. There are some things every one seems to agree on-for example, that warning systems should be accurate and that all government agencies should do everything they can to reduce suffering in the immediate aftermath of a disaster. But on the other issues, there is quite some disagreement"

In order to measure opinion on public policy issues, respondents were asked whether they agree strongly, agree somewhat, disagree somewhat, disagree strongly, or have no opinion, with public financial assistance to disaster victims, people taking responsibility for their choice to locate in known hazard-prone areas, public land-use regulation, building code regulation, and structural mitigation measures. Five of the specific questions are reproduced below:

- For instance, one view is that people really know the risks they are taking when they live in areas prone to floods, tornadoes, blizzards, and forest or brush fires. Since people take these risks knowingly, therefore, they alone should bear the costs of damage to their homes and other possessions. How about you?
- Another view says that natural disasters cannot really be predicted or controlled. They can happen to almost anyone at any time. Since there is not much that can be done to reduce risks in advance, the government should routinely provide financial assistance to victims of disasters for damage to their homes and other possessions. How about you?
- Yet another view is that regardless of whether people really know the risks, the government should keep people from building in dangerous areas through regulations on how land can be used. How about you?
- A final view is that regardless of whether people really know the risk, the government should require local building codes that would make people construct buildings safe and strong enough to withstand a serious natural disaster. Do you agree strongly, agree somewhat, disagree somewhat, or disagree strongly.
- Some people argue that the government should make vulnerable areas safer by building protective public works, such as flood water reservoir, levees, embankments/ permanent dikes, and the like. According to this view, the government should spend money on those structural protective measures rather than spending money on disaster assistance. Do you agree----

2.3 Results of the Assessments.

As can be seen from Table 6, a consensus exists in support of four of the five public mitigation policies. A high percentage (69 %) of disapproval exists of the proposition that the risk takers who knowingly locate in a hazard-prone area, should bear the responsibility

themselves. However, it is important to note that sizeable number (31%) of the respondents supports such proposition. The disapproval rating indicates that the individual should not bear full responsibility for the consequence of living in a higher risk area. The issue of partial responsibility was not explored.

Respondents appear to take very strong positions in favour of flood-proofing through building codes (96%) and land use regulations (78%). There were only four percent of the respondents who disagreed on this issue, while none disagreed strongly. The next highly appreciated proposition is the mitigation approach through government expenditures on structural measures, such as embankments, permanent diking, levees and reservoirs. Eighty two percent agreed to this proposition.

Strong support also exists in favour of public financial assistance. Here, about three quarters of the respondents agree that the government should provide financial support to the victims, irrespective of their knowledge of risk and liability. Nevertheless, 26 percent of the respondents disagree with the proposition. Interestingly, some fifteen years back, similar positions were identified by Rossi *et. al.*, (1982) in an study in the USA. Rossi also pointed out that respondents in his study hardly paid any attention to the concerns expressed by environmentalists and other hazard experts regarding the negative impacts of structural mitigation measures. The current study did not probe this relationship.

Table 6: Assessment of Attitudes towards Public Disaster Mitigation Policies

(percent)

Opinion	Risk Takers Responsibility	Financial Assistance	Land-use Regulation	Building Codes	Structural Measures
Disagree Strongly	39	4	22	0	5
Disagree Somewhat	30	22	0	4	5
Total <i>Disagreed</i>	69	26	22	4	10
Agree Somewhat	26	52	39	31	52
Agree Strongly	5	22	39	65	30
Total <i>Agreed</i>	31	74	78	96	82

3. Debriefing Session for the Senior Officers of the Rural Municipalities and Towns of the Red River Valley- Morris, November 24, 1997.

The flood overwhelmed everybody - residents, communities, the province and the military. This was a consensual conclusion reached early in the session. With such a conclusion you might expect havoc to have resulted and enormous losses incurred. Yet, as the session unfolded, it was clear that, although significant impacts were received, the valley emerged bloodied but not defeated. The session identified a number of areas with positive outcomes. It also identified issues on which improvement is needed. Many of both sets of

outcomes were common to all or most municipalities. The session passed quickly. When it ended, the participants agreed that the session was too brief. The recovery phase had barely been addressed and people had additional issues to introduce. It was also agreed that the session had been beneficial. Consequently, another debriefing session is planned for the middle of December.

3.1 Where Municipalities Did Well.

Community effort was outstanding in all RMs. Vast numbers of people performed exceedingly well; many went way beyond the call of duty in order to accomplish the needs of the community. Individuals pushed themselves to the limit. Public works employees, volunteer firemen, support staff and volunteers worked to exhaustion. When it became necessary for civic officials to dike their own property, others stepped forward to shoulder their responsibilities. Most participants used community in a broad sense, for it was noted that the extra effort was not restrict to residents of their municipalities. The Mennonite and Hutterite communities, schools from outside the region, members of DNR, the RCMP, the military and local radio stations were acknowledged for their efforts. The contributions from these groups before and after the flood were greatly appreciated. In general, the participants believed that everyone, including those individuals with whom they had disputes, did their best to assist in protecting the municipality.

Communities that had previously experienced flooding were better prepared than those that had not. They started preparations sooner, were better organized, utilized their resources more efficiently and had fewer problems. Many EOCs were believed to be effective during the preparation and response phases. In some communities, the Councils came together to work for one purpose. Effective team work was established, consensual decision making occurred, and excellent communication systems were instituted. In many RMs, a sense of community developed that was accompanied by a shared understanding of the needs and risks. A few communities have already reviewed their operations during the flood and identified internal changes that would improve their efforts in the next flood.

Everybody agreed that hiring local contractors with diking expertise was crucial to establishing their preparedness. Knowing the capabilities of the contractor provided confidence in the contractor's ability to deliver a quality product within the temporal parameters of the preparation stage. Using local contractors, despite the difficulties it causes for reimbursement schemes, was viewed as an issue of quality assurance. A known entity does not require as much oversight as an unknown one. Moreover, using a contractor who is known and respected by members of the community instills a sense of confidence in the end product among residents. Both consequences facilitate preparations and solidify the base for the response effort.

Communication among municipalities was very important. Reeves consulted each other about problems; sought possible solutions from one another, and received support from one another. The loss of these interactions because of communication breakdowns early in the response phase was viewed as a serious loss.

Most RMs thought the performance of the mandatory evacuation went well. Despite the controversy surrounding it, the evacuation was systematic, orderly and completed on time. Some RMs established a system to liaise with the evacuees to keep informed of their needs and to provide them about the status of events in the evacuated area.

While the discussion was not designed to examine specific strategies, discussants did provide concrete examples when making more general points. Some of the strategies mentioned were atypical. Some unusual strategies that proved effective included:

- Hiring Interlake fishermen and their boats for water taxiing. An unexpected bonus was the fishermen's experience allowed them to serve as harbour masters.
- Establishing a media policy to help inform the public about the current status of events.
- Using the communication system of the fire department when normal communication systems failed.
- Developing of a citizen's newsletter to provide information to residents.

3. 2. Where Improvement Is Needed.

3. 2. 1 Constraints on Preparedness Activities.

As a general observation it was noted that areas in municipalities that had not recently experienced flooding had more difficulties getting organized for this year's flood. This was true throughout the valley. While some of this difference may be attributable to a belief that the flood would not happen in their region, most of it was attributed to the practice that some areas of the RMs obtained in recent floods.

Financial uncertainty was uniformly viewed as the major constraint on preparedness activities. This was particularly true if the decision-makers were inexperienced in flood-fighting. Budgets are small and fully committed. Making commitments in the absence of knowing where the money to be obtained was viewed as fiscally irresponsible. Consequently, very cautious, conservative approaches were taken to the initiation of major or expensive activities. Decision-makers were conflicted: if they made commitments and there was no flood, then the RM could be saddled with a substantial debt; but if they made no commitments, and a flood happened, then they and their friends and neighbours could lose their homes. Too frequently, the concerns about finances were driving the preparedness decisions, constraining the window for action and how actions would be undertaken. In some cases, the introduced delays were too long and preparations were not completed or required a frenetic pace to be completed. Financial uncertainties need to be removed from the preparedness phase. An agreement to a formula based on the flood forecast probabilities and the level of the needed response for that forecasted level is needed so that prudent but prompt preparations can be undertaken in the RMs.

And finally, for the border municipalities, there was a great deal of uncertainty about the actions that were happening just south of them. This uncertainty persisted into the flood response phase. American mitigation activities moved water rapidly through the valley and also changed the overland water's direction and flow dynamics. This was particularly true when the Americans breached roads, constructed dikes, etc. The border municipalities were fighting blind. Water was appearing where it was not suppose to be. While there may have been international cooperation on forecasting data, the actions taken during responding to a flood need also to be communicated as they can have more immediate effects on flood management problems in the border municipalities. There is no mechanism for this to happen.

3. 2. 2. Constraints on the Response to the Flood.

The location of the EOC was a problem for a few municipalities. When inside a ring dike, the EOC becomes isolated. It is more difficult to arrange the necessary coordinating meetings, to track evacuee problems, and to initiate actions. Moreover, if the ring dike fails, the EOC may rapidly become dysfunctional. Alternative or back-up sites need to be identified and prepared.

The major problem in responding was the lack of equipment and personnel to adequately respond to the contingencies that could develop during the flood stage. The problems increased as you moved down the valley. It was believed that this was partly due to differential timing of events. The southern municipalities had to respond first, and they were able to obtain most of the resources that were required. But as the high waters moved north, greater demands for resources were needed. As the flood duration was lengthy, transferring resources northward was not possible, consequently the demand on the limited pool of resources escalated over the time of the flood.

Many RMs reported difficulties in obtaining heavy equipment and operators, and knowledgeable contractors. The situation was exacerbated when the province started to construct the Brunkild dike. Not only was it more difficult to obtain these needed resources, but committed resources were extracted and relocated for dike construction south of the city. At least one farm was flooded because the work being done on its ring dike was not completed. This action negatively affected the response capacity of, and morale in the RMs.

The most disruptive action during the response phase was the province's mandatory evacuation order. Some RMs had already issued local evacuation notices, and the fact that some evacuation was needed was agreed to by many. However, the methods used, often involving fear-mongering and intimidation, were unnecessary, and had the result of creating havoc in many municipalities. Far more time and effort were needed to deal with the impact of the mandatory evacuation order processes than were needed to organize and carry out the evacuation. Strong irritation lingers over this action both among the decision-makers in the valley and among many residents. Little has been done by the province to address this irritation.

3. 2. 3 Interactions With Others.

All RMs reported problems with interactions with others, where others might be residents, provincial departments, the military, or relief organizations.

With residents.

In each municipality there were people who did not heed warnings and begin preparations for the flood. Inertia resulted from disbelief. "Won't be a flood," "Can't be as bad as 1950," "Haven't been flooded before, can't happen now," "There's lots of time before the water will be here." were common refrains. The consequences were some people were ill-prepared. In two areas, some farmers had failed to remove stored grain; others lost property and homes. The inertia resulted in late preparations and demands for immediate service, often after the individuals had panicked. In the longer term, inertia in preparedness yielded problems during the response phase of the flood.

In some RMs, residents overreacted to the forecasts. They believed that the forecasts were wrong and that they would be flooded. Despite assurances that they were beyond the worse case scenario, they demanded resources to defend their properties against the flood. Not only did these individuals disrupt the preparedness activities, they also diverted needed resources from high priority needs. Moreover, some of these people were insistent, aggressive, and were interpersonal problems for the emergency personnel.

In some RMs, individuals resisted the evacuation orders. The resistance was quite strong in situations where people had successfully defended their property in earlier floods.

Two generalizations appear to be operating. First, the actions of many individuals were being driven by their personal experiences with flooding. Second, some individuals were placing personal priorities ahead of community needs.

With government departments.

All RMs expressed some dissatisfaction with MEMO, although the causes often varied. Common to all were concerns about: insufficient consultations on needs during the preparedness stage; delayed communications, inconsistent communications, insufficient communication on response options, unilateral decision-making without the assumption of the corresponding responsibility, and usurpation of municipality responsibilities. The most serious problem was the way in which the mandatory evacuation situation was handled. It was agreed that MEMO did not appear responsive to community differences. The RMs were treated as though they all faced the same threat, had the same response capabilities and faced identical impacts. A few RMs had difficulties interacting with particular MEMO staff. Others did not get timely advice to problems that required rapid action. There is widespread belief that the model outlined in the provincial emergency plan did not work: serious confusions about authority and responsibilities exist.

The major problems with other departments resulted from the lack of continuity that happened as the departments shifted personnel in and out of the flooded area. The problem was particularly intrusive when it originated in one of the departments (RCMP, DNR) crucial to the RMs flood-fighting activities. Different people; different styles; different decision-making criteria. For the communities, the changes were quite disruptive and took time and energy away from the principal task- flood fighting. Some RMs found that many departments, or at least some of the field workers for the departments, were resistant to incorporating local knowledge into their decision-making and recommendations. Other RMs felt that the people working with them had neither the training nor knowledge to make the decisions for which they had responsibility. And finally, it was noted by several RMs that many departments had a few loose-cannons: individuals who followed their own agenda rather than the agreements that were reached by their superiors. It is hoped that such individuals will be identified and removed from emergency services in the valley.

There was also some dissatisfaction with water forecasts. The format of the information was not readily understood by residents. Information about the movement of water over land was inadequate. Predictions for water elevations were with respect to the Red River, whereas peak water heights were caused by tributaries to the Red, and this fact was not part of the information sent to the RM.

With the military.

Few RMs were happy with chain-of-command decision-making. It caused what was perceived as unnecessarily long delays in obtaining authorizations for actions, inconsistent decisions over time, and the countermanding of decision to which all parties had agreed. The interactions were very uneven across municipalities and even within a municipality if a change in military units occurred. The differences were attributed to differences in how the local military commander viewed his mandate. It was generally agreed that the problem lay with the military decision-making process and the psychological profile of a few officers. Once initiated, the response capabilities of the military were impressive. It was further agreed that some of the problems resulted because the activity, assisting Canadian civilians, was a novel one for the military. A willingness to participate in joint exercises to work out the problems with military-civilian interactions was expressed by several discussants.

With relief organizations.

Initially there were too few relief organizations, but that changed quickly. By the time people were returning to their homes there were too many relief organizations. Their activities appeared uncoordinated. It was not always clear which agencies were doing what. Consequently, it was difficult for residents to quickly and easily get the relief aid they required. Similar problems appeared at the beginning of the recovery phase. MEMO's recovery centres solved many of the problems. Better coordination of relief activity during the flood stage needs to be developed.

3. 2. 4 Problems of Organization.

Organizational structures of the military and government departments created inefficiency in the response effort. The military organized itself by RM. Each RM had its own commanding officer. Moving troops from one RM into an adjacent one to provide assistance to a nearby area, a task that is consistent with the provincial emergency plan's dictum that neighbouring RMs should seek assistance from one another, was difficult. Some commanders would permit such a request; others would refuse it; and some would negotiate with their equivalent in the adjacent RM. Changing commanders, changed the procedure.

Government departments are organized by geographical regions. The Red River is frequently a boundary separating different regional divisions. Where a RM is located on both sides of the river, it must interact with two divisions of a department to obtain a single service. Communication problems and inconsistent service can result.

3. 2. 5 Problems of Planning.

A concern was expressed that the flood plan for the valley is incomplete. It is feared that some remote but realistic scenarios have not been explored from a disaster management perspective. For example, it is possible that the drinking water supply for the west side of the river could be contaminated by a flood. It is not at all clear that how this scenario would be handled. Some participants think that more contingency planning is necessary, or, if they exist, shared.

3. 2. 6 Personal Impact.

At the end of the session, it became clear that one of the serious problems for the officials in the valley was that they felt alone during the flood. This sense accompanies the mantle of leadership during crises. However, it was believed that the sense was exacerbated by the actions of the provincial government and military. Too much time and emotional energy were needed to deal with issues of authority and responsibility when the time and energy were need to work for their communities. It was agreed that this problem needs to be addressed before the next emergency occurs.

4. Meeting with Members of the Manitoba Emergency Management Organization - November 27, 1997.

MEMO is a small unit of nine operational personnel who have responsibilities for emergency response coordination throughout the province. MEMO's flood related activities began in February, are ongoing, and will continue until the recovery phase or the emergency is complete. During the flood, the majority of the staff focused on flood-related activities, either in the field as local coordinators with the RMs or in the Provincial command centre. In the field, MEMO personnel had responsibilities for multiple Municipalities. With a small staff and a large area of responsibility, it was at times difficult to maintain two-way communication. All MEMO personnel worked long days and through the weekends during the flooding period.

4. 1 Community Readiness.

The trajectory of flood forecasts changed dramatically in early April. MEMO was preparing for one eventuality, which, as the spring thaw progressed, appeared increasingly unlikely, and then the blizzard created the conditions for a much larger eventuality. The time to switch gears between the two classes of predictions was brief. With misinformation coming from the states, at least up to the time of the Grand Forks flooding, opportunities for disbelief were maximized.

All communities had Emergency Coordinators, Emergency Plans and personnel who had participated in training courses conducted by MEMO. All communities established Emergency Operation Centres once the reality of a flood was clear. Thus, the foundations for managing the flood were available and in place prior to the arrival of the water. While the quality of the emergency plans of, and the number of trained personnel available to, the RMs varied greatly, these variables were not considered to be major determinants of subsequent events.

4. 2 Community Preparedness.

The flood of 1996 was a good exercise for preparing for the flood of 1997. RMs and towns that had that experience tended to have smoother operating preparedness processes relative to those that did not have that experience. Nonetheless, all RMs had problems although these tended to be manifested more in the flood response phase of the emergency.

Municipal administrations were not immune to the sense of disbelief that accompanied the unfolding of the emergency. Not believing that their area might flood delayed their

initiation of preparatory actions. Consequently, some municipalities were less prepared than they could have been and certainly less prepared than others.

RMs have difficulty getting people to serve as Emergency Coordinator. MEMO recommends that fire or police officials not be used because their professional expertise, in all likelihood, will be needed during an emergency. As a consequence, the task is generally assigned to the senior officer of the municipality's administrative staff. In an emergency, they tend to have two major responsibilities for the community: coordinate the emergency response and operationally manage the municipality. Sustained performance of both sets of responsibilities in a prolonged, major emergency is almost an impossible task. Additional support for the administrators should be part of the emergency plan and occur during the preparedness stage, but that was not always the case.

4.3 Community Response.

4.3.1 Sustaining an Integrated Response.

Not all communities attempted to follow their Emergency Plans. And those that did, did not persist at it too long. The magnitude of the event was beyond the scope of the plans. It was also beyond the scope of the human resources trained to manage disasters. There were not enough people to sustain a twenty-four hour, seven days a week operation. In addition, because of the low population density and the amount of territory that each municipality needed to service, individuals were required to assume responsibilities and make decisions on matters several orders of magnitude beyond the level that occurred in their daily non-emergency positions. The difference in the importance of the decisions increased the magnitude of the stress they experienced.

There is a hidden cost to working Red River floods. People must work around the clock for three to six weeks in order to prepare for the flood. By the time high water arrives, people are exhausted both physically and mentally. The preparation phase is an emotional drain and the accumulated stress creates the conditions for burnout during the response phase. The quality of decisions falters, as do the quality of interpersonal interactions. As the process is occurring with all people in the community, it is often difficult for them to recognize it in each other. For some situations, MEMO had arranged for supplemental staff that could be brought in to provide relief for periods of time. The offers tended to be rejected, as the sense of personal responsibility for the success of the response effort kept people from realizing that they needed to take a break from the action in order to recoup some of the energy needed to sustain it.

4.3.2 Mandatory Evacuation.

The mandatory evacuation was called after intensive interactions evaluating risks that people would be facing. It was not done lightly and reflected the deliberation that the safety of the residents of the valley had a significant probability of being at risk. It was known that an orderly evacuation requires 48 hours notice, and that requirement increases to five days when a hospital is involved. Consequently, calling for a mandatory evacuation required significant lead time.

The precipitating event for the evacuation call was a weather threat that promised to produce strong and sustained winds. Under such conditions, the water level could rise (or fall) by five to seven feet in either the south or the north basin of the flooded area, depending on

which way the wind was blowing. The following factors were considered during the deliberations: reliability of the weather forecast; the historical record which documents an average of two such weather systems during the expected period of high water; the amount of freeboard in diked communities and homesteads; the heights of sand bagged dikes around homesteads and their likelihood of withstanding sustained wave action; the reduced capacity to provide rescues during high wind and wave action because small boats would not be useable; the size of rescue operation that could be undertaken with the available large boats and helicopters; the increased risk to rescuers of having to be out in high winds; the even greater risk and difficulty of mounting nighttime rescues; the probability that small boats of residents, if needed because of dike failure, would be unsafe; the water temperature and the probability of first hypothermia and then death if people ended up in the water.

One of the problems with the evacuation situation was the method of its implementation. Because the need to make the decision arrived much quicker than expected, it was necessary to act rapidly. It was believed that there was not sufficient time for the municipalities to undertake the task and have the margin of safety needed in the event that the RMs had difficulties and subsequently required assistance. Unfortunately, the declaration evoked strong community objections. The municipalities apparently felt that they were losing power. In retrospect, it appears that the municipalities may not have had sufficient information about the parameters of the situation.

The problem was also manifested at the level of the individual. Some people refused to evacuate. This concerned MEMO because it appeared that many of these people were so focused on saving their property that they were not conducting realistic risk determinations. Had the conditions been as predicted, some of these people would have lost their homes and possibly their lives.

The valley was fortunate in that the weather system did not materialize in the predicted form. While wind velocities were high and strong wave action resulted, the wind direction shifted often enough that the water was not pushed toward the ends of the flooded areas.

Unlike in the USA where a mandatory evacuation order must be followed and is enforced by the National Guard, there is flexibility in a Canadian "mandatory" evacuation order. Local authorities can alter, slow down, or override the declaration. Such was the case during the flood. This major difference between the American and Canadian systems was viewed as a potential major hurdle to integrated response management systems for the Red River basin.

4. 3. 3 Factors Affecting Effective Response Management.

In retrospect, the key to efficient and effective response management was not the municipality's emergency plan nor the number of its employees that had received disaster management training nor prior experience with floods. While these factors certainly contributed, the best predictor was the level of communication that occurred among the decision-makers and from the decision-makers to the community. Fewer problems seemed to arise and the flood impact seemed to be lower when decision-makers met regularly, acted through consensus, delegated responsibilities to fully informed people, and kept the residents informed of the course of events. Where team approaches were not used, as was the case in some municipalities, intra-community communications suffered. Consequently, the cohesiveness of actions was undermined. Moreover, it was difficult in interacting with the different units within such municipalities to know whether their reports reflect the communities decisions or unilateral action. Such situations posed difficulties for MEMO's

field staff.

It was noted that the communities were not the only units to demonstrated communication difficulties. Differential rates of communication were also noted in the actions of some government departments. "Ownership of the problem" seems to be one of the contributing factors to this difficulty. When departments did not see the problem as theirs, reactions to it were uneven. For example, with the river returned to the river bed, some departments believed the flood is over. As a consequence, it has been more difficult to get their involvement in the flood recovery activities that are still happening.

4.4 Community Recovery.

Communities have had difficulty with the recovery phase of this year's flood. Exhausted employees, the distributed system of recovery programs, and the large number of inquiries from a significant proportion of their populations have made it difficult for the municipalities to cope. These issues were raised by the Reeve of Morris, who suggested that what was needed was the capacity for people to go to a single place in their region to obtain answers and solutions to their problems. MEMO has acted on the suggestion and established Recovery Centres in St. Adolphe, Rosenort and Letellier to provide single site access to recovery programs. The Centres have been well received. Demands on the municipalities have been decreased; services are more accessible, less frustrating to obtain and more personal; and, MEMO's staff have been able to be more efficient and effective. The feedback on the initiative, both from the municipalities and from people who have used the Centres, has been quite positive. From MEMO's perspective, there has been a beneficial side effect to having the Centres: MEMO's staff is receiving valuable information from members of the community about the situations they faced during and after the flood. Such information can be used to refine MEMO's actions during the next flood.

The impact of the effects of the flood on some individuals was so severe that they were incapacitated, unable to start the process of recovery. People in this state need assistance to begin the recovery process. Identifying them and helping them is a needed service. MEMO did not have this capacity in the present flood. It is currently exploring how this capacity can be developed and incorporated into the disaster management in the province.

While not directly related to the performance of the municipalities this year, it was noted that the trauma centres are still operating at full capacity. It is expected that they will have to do so for quite some time. Demands for their services increase whenever there is a snowfall or the forecast of storms. If, in February, there is even the suggestion of a possible flood in the first long-term forecast for the spring of 1998, the prognosis is that the anxiety level for many people in the valley will be quite high. Under these conditions, municipalities will face greater problems during the preparation phase because of the near panic state that is likely to be present.

V. CONCLUSIONS AND RECOMMENDATIONS

In this section we will examine some of the patterns found in the preceding observations, interpret the pattern in light of the contemporary disaster management literature, and offer recommendations for the future. The recommendations are imbedded in the discussion of the related interpretation and have been printed in a boldface font so they can be readily identified. However, prior to initiation this discussion, limitations of the methodology used in

the study will be identified.

1. *Caveats on the Methodology.*

The present observations are based on the memories of the participants. There is little independent evidence associated with these recollections. Consequently, the observations are subject to the natural distortions (Barsalou, 1988) that occur in long-term memory. Distortions that could be affecting remembrances include the following phenomena: integration of material that occurred subsequent to the events being recollected; reinterpretation of a sequence of events after the outcome is known, alterations in the sequences of events, and altered weighting of the importance of components of the events. Even where there is a consensus in the reporting, distortions could be present, particularly, as occurred with the flood activities, if the participants have discussed the events with others in the situation or others with shared experiences. The problem of memory distortion is unavoidable in the present situation. Comparisons to written documents generated through the flood, real-time observation of the activities of the decision makers, and debriefing immediately after the events of interest are the only ways of either minimizing or measuring memory distortion.

A second potential problem, is the actor-observer bias (Harvey, Ickes, & Kidd, 1976) that occurs when people perceive events. Briefly, the attributions as to why events happen differ when you are experiencing them (actor) as compared to when you see others experiencing them (observer). In the former case, the bias is to identify external agencies as causative factors, whereas, in the latter, there is a greater focus on the responsibilities of the actors. This bias is intensified when the experience has a negative outcome. The operation of the bias in the current observations can be seen by the large number of references to system difficulties when members of the community response teams discuss the problems that they endured during the flood. It must be stressed that the operation of this bias is a normal process affecting all perception of human actions. All of us display it. Identifying that the discussions on which this report is based contain evidence for the operation of the bias should not be misinterpreted because it cannot be used to draw inferences about the motivation underlying the discussion.

If perceptions are biased and memories distorted, why report information gathered from focus groups and delayed debriefing sessions? The answer lies in the fact that people, in the absence of evidence that they accept as disconfirming, will take future actions based on their distorted perceptions and memories (Weiner, 1985). Consequently, to understand potential future actions, requires identifying the conclusions that people have reached based on their experiences.

In the following paragraphs, we identify the conclusions reached by the disaster management decision-makers of the Rural Municipalities and Towns of the Red River valley. Some conclusions can be addressed immediately; others will need to be explored further before the optimal option can be identified and acted upon; and still others will require further information before options can be explored.

2. The Role of Leadership.

On the basis of a comparison among twenty-two case studies, Scanlon (1996) has effectively argued that emergency management in Canada is more effective and therefore the impact of an event is lower, when the mayor is actively involved in planning for emergencies

before they happen. By "actively involved," Scanlon means a mayor who either directly engages in, or who set a high priority for, emergency planning. Measures of an effective planning included: existence of an emergency plan, the existence of a call-out system for rapidly mobilizing key personnel, existence of an EOC for the coordination of activity, an effective communication system, and effective leadership when responding to the emergency.

As the preparations for the flood of 1997 began, the measures called for by Scanlon were put in place. Moreover, the Reeves and Mayors were active in both the preparedness and response phases of the flood. Thus, the definitions of active Mayors and effective emergency planning were met in all RMs and towns.

However, the perception is that the RMs were not equally effective in managing either the preparations or the reactions to the flood. EOC location was a problem for some; communication systems failures were noted; and, almost no one ended up following their emergency plans. Given the magnitude of the flood, it is possible that the flood's size was simply too large for the population basis to effectively counter. Yet, if this were true, the management problems should be roughly correlated with the amount of area flooded in the RMs. There were major differences in the magnitude of the challenge that each RM faced, but the sense is that the management problems were not directly related to the challenge.

The perceptions of the participants of this study suggest that three different factors may have differentiated the effectiveness of the emergency management. These are: experience in flood responding, a team approach to decision making, and continuity in team composition during the emergency. None of these factors are mentioned by Scanlon (1996).

The flood of 1996 was seen by almost all participants as excellent training for reacting in 1997. Preparing for the flood was considered to be more effective and efficient and responding more orderly in those RMs which were flooded in 1996. The team approach was viewed as facilitating communication among key personnel and to the residents of the RM. Daily meetings of key personnel in which decisions were made by consensus and widely and openly communicated were seen as promoting the coherency of action and the consistent enactment of priority actions. Continuity of team composition was seen as vital to the efficient and effective operation of the team. In situations where military and government personnel were shuffled in and out of a RM, working relationships were shattered and new ones needed to be established. These requirements disrupted the emergency management at crucial periods.

On the basis of the information gathered for this study, it is not possible to determine whether these three factors actually influenced the effectiveness of emergency management during the flood. Given that the standard criteria for effectiveness did not differentiate the problems with emergency management in the valley, additional research of the issue is needed. It should be noted that two of the three possibilities, experience and team management, are factors that the RMs can control. The third, requires provincial, and, if military aid is sought, military action to remedy.

3. Reactions Compared to Best Practices

Results from contemporary disaster management research are converging on two generalities (Dynes, 1993, 1994; Rogge, 1992; Quarantelli, 1997). The first generality is that management demands during preparedness planning are different from the management demands of responding to an emergency. The second is that a set of best practices is

emerging for both preparedness and response management³.

In this section we will first identify the difference between the two types of management. Then for each type of management we will present a set of best practices that have emerged from the literature and compare the performance of the RMs, as judged by the participants, to the practices.

3.1 Preparedness Planning and Response Management Differences.

Preparedness planning focuses on designing strategies to assist a community in dealing with emergencies. It focuses on preparing for common needs that are found in all emergencies; contingency planning for different classes of emergencies; and identification of the resource capacities present. The strategy is tailored to the constraints imposed by the community and establishes the criteria that dictate that external resources are needed.

Response management is tactical management. It requires the ability to react to the changes that occur as the emergency progresses. The nature of emergencies means that there will be unpredicted components to them. Effective management requires rapid, accurate reaction to these components. Nonetheless, there are some generic aspects to responding that can be anticipated and therefore for which a community can plan.

3.2 RM Preparedness Planning Compared to Best Practices.

There is an extensive literature on best practices for preparedness planning (e.g., Dynes, 1993, 1994; Rogge, 1992) which has most recently been summarized by Quarantelli (1997). Quarantelli's list of best practices is as follows:

- A. *Views disasters as both qualitatively and quantitatively different from accidents and minor emergencies.*
- B. *Highlights a continuous planning process rather than the production of an end-product, such as a written plan (note similarity to strategic planning in business).*
- C. *Adopts a multi-hazard rather than a single hazard focus, and is generic rather than agent specific.*
- D. *Builds on the notion that what is needed is a model that focuses in the coordination of emergent resources, rather than trying to impose some kind of command and control.*
- E. *Focuses on general principles rather than specific details.*
- F. *Assumes potential victims will react well, instead of badly, during the emergency time of major crises.*
- G. *Emphasizes the need for intra- and inter-organizational integration in the process.*
- H. *Encourages appropriate actions by anticipating likely problems and possible*

³ It is important to note that employing best practices does not mean that emergencies will not happen. There use optimizes mitigation effectiveness and minimizes the impact of the event.

solutions or options.

- I. Builds on social-science research findings derived from systematic data rather than personal anecdotes or "war stories."*
- J. Includes all four time phases of the planning process (that is mitigation, preparedness, response and recovery) rather than a single phase.*

With the information that was received from the participants, it is not possible to examine whether all the best practices were present. In particular, practice #10 requires examination of material that was not part of this study. Other practices were not directly commented on but their use can be inferred from the general procedures advocated by the Province. Practices #1, #3, #5 and #7 are consistent with provincial expectations. The actions taken during the preparedness stages suggest that the RMs were generally following these practices. However, there is a caveat to the assertion that #7 was universally used. Inter-organizational integration was the rule, but there were problems with its practice. Several RMs reported problems with the personnel assigned to work with them. Integration into a management structure was not occurring with these people. There is a need to identify the criteria that promote integration of personnel from assisting organizations into community emergency management systems and to promote these criteria to all organizations that form part of community management systems. In addition, the rotation of personnel into the RMs by the military and some departments disrupted and distracted the community management systems. This practice works against sustaining an integrated management system. An examination of personnel deployment practices during an emergency is needed.

Everybody had a written plan. Few RMs used it. This fact suggests that practices #2 (a continuing planning process) and #8 (anticipating likely problems) were not generally employed. Further suggestions that practice #8 was not used come from examining the types of problems that were reported to have occurred. Most of these could have been anticipated (e.g., identification of essential service needs, poor location of EOC, compliance problems, excessive demand for resources), although it might not always have been possible to have prevented them.

The characteristics of flooding in the Red River valley may well have contributed to the lack of deployment of the above two practices. With a slow onset (by emergency standards) and a recent history of occurrences, it is possible for people to build up experience at dealing with the events. Actions can then be based on personal experience (which is anecdotal and therefore inconsistent with practice #9) to which one has faster access, relative to a written plan, which provides one with a greater confidence in the likely outcome. This tactic was adopted by individuals and RMs throughout the valley.

The preparedness planning in all RMs assumed that the residents would react rationally and responsibly. For the most part, that assumption was assumed through the course of the emergency. The assumption and observation are consistent with best practice #6. There is some concern that if a flood occurs in 1998, the reaction may be more volatile. This is in part attributed to the negative consequences of actions forced upon the RMs, such as the mandatory evacuation, and in part to the fact that many of the residents who suffered losses during the flood have not recovered from the trauma of the experiences.

Both of these issues need to be addressed to ensure that best practice #6 remains an effective assumption for preparedness planning. There is a need for communities to learn the lessons that can be obtained from the mandatory evacuation experiences and then to develop criteria to use in making future judgements on the evacuation of their community. In addition, there is a need to determine the magnitude of the trauma effects that occurred in the flood plain during the flood of 1997 and to determine the possible impacts on preparedness and response capabilities that may result because of the trauma.

In some RMs, best practice #4 (coordination of emergent resources) appeared to be operative. Team management approaches, the emergence of new leaders when the existing leaders had to attend to the protection of their own property, the flexibility of leadership structure which changed as the needed expertise changed (e.g., the authority given the emergency coordinator at Roseau River), and the use of local specialized expertise in novel fashions, are all consistent with this practice. However, other RMs used the more traditional approach of command and control procedures. Some of these experienced problems when they were not supported by excellent communication systems.

In summary, all RMs used some best practices. No RM used all the best practices. This suggests that there is an opportunity for the RMs to improve their preparedness planning. However, under the current system, this is a decision that the RMs must reach on their own. There is little incentive for them to address the issue. At the present time, the RMs are still deeply involved in recovery activities related to the flood. They have neither the time nor the money to engage in the process. Equally importantly, few RMs have the local expertise needed to generate a community-based preparedness plan. The above analysis suggests two things are needed. **First, an incentive plan for preparedness action is needed.** Such a plan would have three advantages. First, to take a preparedness action, requires that a preparedness plan be in place. Hence such an incentive plan would foster preparedness planning. Second, if an incentive plan was available on an annual basis, it would foster a regular review of the plan to adjust it to changes in local needs. These would put in place best practice #2 - a continuing planning process. And third, such an incentive plan would benefit the mitigation needs of the RMs.

In the absence of an incentive plan, there still might be some communities that wish to evaluate and adjust their preparedness plans. Some of these communities will require assistance to do so. Consequently, **there is a need for resources to assist communities in refining their preparedness plans.** Any plan to address this need must take into consideration that all communities in the valley theoretically need the assistance. This includes the Roseau River Indian Reserve which has already identified that it requires both a better plan, a plan that addresses mitigation, preparedness, response and recovery (practice #10) and assistance in generating it. As the most vulnerable community in the valley its planning needs should have a high priority. Therefore, **it is recommended that a mechanism be found that would permit Roseau River Indian Reserve to gain the assistance required to develop a community preparedness plan.**

3.3 RM Response Management Compared to Best Practices.

The recognition that good disaster management has common characteristics that generate best practices is a more recent event. Quarantelli (1997) has integrated the literature to identify these practices. They are as follows:

1. *Correctly recognize differences between agent-generated and response-generated needs and demands.*
2. *Adequately carrying out generic functions.*
3. *Effectively mobilizing personnel and resources.*
4. *Generating an appropriate delegation of tasks and division of labour.*
5. *Allowing the adequate processing of information.*
6. *Properly exercising decision-making.*
7. *Developing overall coordination.*
8. *Blending emergent and established organizational behaviours.*
9. *Providing appropriate reports for the news media.*
10. *Having a well-functioning emergency operations centre.*

To this list we would add:

11. *Having a reentry strategy.*
12. *Having a trauma treatment strategy.*

As was the case with the best practices for preparedness planning, the information provided by the participants does not permit comparisons to all the above best response management practices. In particular, there were no comments concerning practice #8 (emergent organizations) or practice #12 (RM trauma treatment strategies - although it is clear that the Province has established trauma treatment teams for the valley. Whether this was a provincial initiative or the result of prior agreement is not known). In addition, reentry issues were not discussed in great detail. And finally, the discussion of best practice #5 concerning the processing of information will be delayed and can be found in the section on System Issues.

All RMs had EOCs. Almost all RMs believe their EOCs were effective. Consequently, Practice #10 appears to have been a standard practice during the flood. All RMs also had EPCs. Some of the EPCs used team management processes to reach consensual decisions. Because consensual agreement in how to carry out a task is a defining characteristic of "coordination," such EPCs are effectively providing overall response coordination (practice #7). In addition, the team approach tends to minimize challenges to decision-making effectiveness (impact of the loss of key people due to burnout, conflict over responsibilities, inter-organizational disputes, poor communication of action plans), the approach is one way in which practice #6 (properly exercising decision-making) can be implemented. And finally, full discussions by the key people leading to consensual decisions leads to delegation of tasks (practice #4) and optimizes the deployment of personnel and resources (practice #3). It should be noted, that most RMs did not have sufficient personnel or resources to sustain the response stage. Optimizing the use of the two does not preclude the possibility that you will

be overwhelmed. Such a consequence is a function of the magnitude of the hazard creating the emergency and the preparedness planning that precedes the necessity to respond.

Alternative management strategies may also be successful in these domains. However, the comments of participants indicated that some RMs had difficulty in coordinating activities (practice #7). This was particularly true when inter-organizational coordination was necessary. In addition, negative impact on decision-making was seen in some RMs when key people were absent or because of poor intra-organizational communications (practice #6).

Practice #9, providing appropriate reports to the media, can be seen in several RMs. At least one RM had a formal media policy. Others, established good working relationships with representatives of the local media. And finally, where local media were not present, RMs developed their own means of providing appropriate information to the residents (e.g., phone networks, citizens' newsletters). Thus, the EPCs of the RMs had adopted many procedures which were consistent with best practice #9.

The remaining two best practices require some amplification to understand how the practice might be put in place. In best practice #1, a distinction is being made between effects caused by the natural hazard (agent-produced) and effects caused by how one organizes to counter the agent-produced effects (response-generated). An example of an agent-produced effect would be wave action undermining a diking structure. An example of a response-generated demand would be to organize the resources needed to protect a dike from wave action and to repair a dike when wave action is attacking it.

While a formal recognition of the distinction did not appear in the discussions with decision-makers, their actions suggest that all RMs were acting in a fashion that was consistent with the distinction. Much of this action was gained from personal experience in previous floods. The types of effects produced by high waters were anticipated (e.g., loss of road access, seepage through dikes), and countermeasures were developed (e.g., boats for access; pumps for water removal). Differences among the RMs appeared to be to be ones of degree and to be related to the completeness with which they designed countermeasures. For example, having boats available gives you the capacity to supply, support, and if necessary, rescue residents who live outside the ring dikes. Having large boats with experienced pilots extends the capacity by permitting the safe performance of these tasks when there is significant wave action on the water. Thus, all RMs have approximations to best practice #1.

Despite that conclusion, there is one response-generated need for which no RM has been able to develop a good solution. That need is for a safe and reliable means of transporting people and supplies over flood waters. The need is a constraint on response management and the inability to meet the need is one of the prime determinants of shifting strategies from keep the water from the people to moving the people from the water. This shift in strategy is seen in the issuance of voluntary and mandatory evacuation notices. Evacuation processes present disaster managers with a large set of response-generated needs: from the safe orderly removal of people, accommodations for evacuees, provision of basic necessities during the evacuation, and reentry and recovery assistance, to name but a few. In addition, the process produces tremendous anxiety in those that are evacuated. The social cost to this anxiety, some of which may not be incurred for months and years, are enormous, both for the individual experiencing the effects and for the social and health systems that deal with them. It is possible that if criteria for declaring an evacuation can be adjusted, which might be possible if the transportation problem is addressed, then, in the future fewer people might have to be evacuated.

The preceding discussion leads to two recommendations. First, there is a need for safe, reliable transportation of people and supplies over flood waters. To be beneficial the solution would have to have the capability of rapidly dealing with reasonably large numbers of people. Second, there is a need to determine the social and health costs that result as a function of being evacuated relative to not being evacuated.

The final best practice (#3) involves adequately carrying out the generic functions of response management. Generic functions are activities that are common to most emergencies (Quarantelli, 1997). They would include warnings, evacuations, providing sheltering, emergency care, search and rescue, protection of property, mobilizing emergency personnel and resources, assessing the damage, coordinating emergency management activities and restoring essential public services. All these functions were performed in all RMs, although not necessarily by the RM. The major differences among RMs were a matter of degree. Some seemed more efficient and effective than others.

There was no assessment of whether the performance of these functions was done adequately. That judgement needs to be made by those who received the service. From a management improvement perspective, it is important to know whether the performance in these domains was adequate. The RMs need to assess the adequacy of the performance of the generic functions that were provided during the flood.

In summary, the comparison of best practices in response management shows a pattern that is similar to that obtained in the comparison of best practices in preparedness planning: all RMs were using some best practices; no RM was using all of them. The implications from the pattern of evaluations are the same as noted in the summary portion of the discussion of comparisons to best practices for preparedness planning.

This section of the report is based on the premise that applied social science research can identify practices that help maximize the effectiveness of disaster management. The approach is not consistent with the practice of flood fighting in the valley. At the RM level, the emergency plan tended to be ignored or discarded. Decision-making was based on experience. A similar phenomenon was identified as driving the decision-making of the residents of the valley. It was generally perceived that RMs and individuals with recent experience with flooding managed better than those that did not have that experience.

But experience is a two-edged sword. We were also informed that many people, including some decision-makers, resisted initiating action because experience told them that they would not be flooded. Some people maintained this position even when the flood forecasters were increasingly confident in the magnitude of the flood. Thus, people who encountered difficulties were behaving exactly the same as those who were not. Both groups used experience to drive their decision-making and actions.

Experience can be viewed as unstructured training. When similar situations arise, the benefits of the training show. However, when novel situations are encountered or when similar situations contain previously unencountered components occur, then experience may offer little guidance. This was seen during the flood when experienced decision-makers were facing decisions not previously encountered (e.g., the need for evacuation, the need to work with the military). Such decisions created greater stress and seemed to be associated with more problems. The effective management of such situations did not seem to be related to the flood-fighting experience of the decision-makers.

One of the principal advantages of planning is that it should make you examine situations that you have not experienced. And when planning and training are combined, there normally is a beneficial effect for the management of unexpected and unexperienced events.

Experience has a role in planning and disaster management. If planning is done well, it should take advantage of people's experience and knowledge about local conditions. What is unknown is how this process should occur. **We need to know how experience affects the generation and selection of options in decision making.** Once the process is understood, it would then be possible to use the knowledge to improve the quality of decisions that are made by individuals and decision-makers in an emergency. That is **we need to develop procedures that will train people to be better decision-makers when faced with situations not previously experienced.**

4. System Issues.

RMs do not operate in isolation. They are responsible for services to their residents and rely on services from the Province. An exception to this description occurs with the Roseau River Indian Reserve. It relies on the federal government for services which complicates for them several of the issues to be raised below. In emergency situations, RMs provide assistance to the residences and can call on the province for advice and additional assistance. If the magnitude of the event exceeds the capacities of the provincial government, it can request assistance from the federal government. Thus, the emergency response system is a hierarchical one that is design to adjust the response capacities to the magnitude of the event that is occurring.

The comments provided by the participants suggest that some of the difficulties in their emergency management of the RMs may be due to system problems. These will be identified in this section.

4.1 Financing Preparedness Activities.

One of the unique features of flooding in the Red River valley is that the onset of the high water is slow relative to the onset characteristics of many other types of emergencies. With the technical systems that are available, it is possible to estimate the probability of a flood and its magnitude in advance of its onset. This fact gives residents and RMs a window in which actions can be taken to minimize the impact of a flood of the predicted magnitude.

Unfortunately, financing emergency activities seems to be determined by a model based on reacting to the occurrence of an emergency rather than to reacting to the prediction of one. This fact places RM decision-makers in a quandary. During the early part of the preparedness phase, they do not know whether financial aid will be available. If they react to the prediction and engage in preparedness activities and the flood does not materialize, then the RM could face financial problems. On the other hand, if they do nothing or wait until there is more certainty in the prediction, they run the risk of being unable to complete the preparedness activities, thereby increasing the probability of significant flood damages. Fiscal prudence tends to be the choice, particularly among those with no flood fighting experience. The result is that the RMs are not able to take full advantage of the window of opportunity that forecasters provide them. **There is a need for the development of a means for financing preparedness activities for slow-onset emergencies.** To lay the foundation for meeting this

need, the costs of both the response activities and the flood's impacts in RMs that constrained their preparedness activities need to be determined and compared to similar costs in RMs that did not constrain the onset of their preparedness activities.

4.2 Conflicting Priorities.

Many of the issues raised by the discussants reflect differences in priorities in the different levels of the emergency response system. The priorities the RMs were pursuing at times conflicted with those of government departments and MEMO (e.g., the need for mandatory evacuation), with the military (the need to respond to the situation versus the need to follow orders) and with some residence (the lack of compliance to RM recommendations). As the different levels of the system have different responsibilities, the occurrence of some differences during response management is likely to occur. This will be particularly true when dealing with agent-produced effects. There is no easy solution to such problems. Some points may not be resolvable and the parties may have to agree to disagree. The impact of the dispute can be minimized if there is a clear understanding of the needs and objectives of both parties. This can be provided through an effective communication system during the emergency and a joint debriefing session after it is over. There were communication problems during the emergency that may have exacerbated disputes. And because the emergency is not over for the RMs and some government departments, there has been little opportunity for a joint debriefing. There is a need for joint debriefing sessions to develop an understanding of the disputes that happened during the flood.

However, in many cases the disputes were about response-generated problems. These too need to be explored in a joint debriefing session. As response-generated problems tend to reflect weaknesses in planning, the purpose of the debriefing session should have different objectives. After reaching an understanding of the basis of the disputes, protocols for making decisions in similar future situations need to be established. For disputes that are identified as response-generated disputes, decision making protocols need to be established.

4.3 Communications.

Communications in an emergency situation have three key components. First there must be a means of communicating. Second, the content of the communication must be understood by the recipient. Third, the information in the communication must flow, that is, be available to those that need the information. From the perspective of the RMs, there were system problems with each component of communications.

Many people considered the reliability of communication systems to have been significantly improved over previous major floods. This change is attributed to the widespread use of cellular phones. Nonetheless, there were some problems, particularly in the southern part of the valley. At times, the cellular network would overload and establishing contacts was impossible. In crucial situations such a loss could have had critical consequences. There is a need to identify ways to guarantee the operation of communications systems during a flood in the valley. A second example is also noteworthy. Early in the preparations for the flood, the Reeves established an informal communication network in order to obtain advice and support from one another. The network was viewed as quite successful and useful. During the flooding, the network was lost. The consequence was a loss of a crucial information channel at a delicate stage of the response management. Clearly, there is a need for a reliable communication for the key decision makers in the RMs.

There were also system problems with the content of the information. Generally, these were correctable by further communication. However, on occasion the content caused confusion or false senses of alarm or security. For example, some residents had difficulty understanding the water level information. They wanted to know how deep the water would be at their place, where it would come from and when would it be there. It was not always easy for them to convert water level measures into this information. Other residents did not understand that the water levels did not include an allowance for wave action. Building dikes to the predicted level plus two feet failed to protect them from the effects of the waves. The examples indicate that **there is a need to 1) determine what information is needed by residents so they can make informed decisions about their response strategies, and 2) to develop a means to deliver that information.**

The problems did not occur only with residents. They were also found in the interactions between the Province and the RMs. For example, when the mandatory evacuation was first announced through the media, one town found to its surprise that it was included. It was only after several hours that it was determined that the repeated announcements were in error and that the town was not to be evacuated. In the mean time, the officials and residents were in a high state of anxiety. On the other hand, the Roseau River Indian Reserve was not included in the initial announcements of the areas to be evacuated, although the RMs around it were. Eventually, they were able to find out from the federal Department of Indian Affairs that they also should evacuate. The circuitous system of communication to the Reserve places the inhabitants at a severe disadvantage at being able to prepare and respond in a studied fashion. While the activities of the Reserve are a matter for provincial-federal negotiations, from a disaster management perspective, the current arrangement makes little sense and places the population at a greater risk than need be. **There is a need to include the Roseau River Indian Reserve in the province's flood planning and responding activities.**

The availability of information from the provincial departments and the military was a great concern of the decision-makers of the RMs. Delayed responding, difficulty in getting rapid advice, insufficient information and inconsistent communications were reported by all RMs. The differences in number of problems appeared to be one of degree among the RMs. It also appeared to be related to the stages of the flood. A greater number of problems occurred in the response phase. MEMO also reported communication problems. They needed more information from the RMs than they received. Why these problems were occurring is not clear. The fact that the problems increased as the communication load increased and affected the flow in both directions suggests that the problem might be related to the staffing of the communications system. This is a speculation. **There is a need to understand why there were communication difficulties and to develop a communication system that overcomes the problems.**

And finally, there was no information available to the southern RMs about the actions being taken south of the border that might have affected the flood's progress. The response management systems in the province and North Dakota and Minnesota did not appear to be interacting. This information is needed in order to anticipate potential problems. Therefore, **there is a need to establish a cross border response management system.**

4.4 Future Planning.

During the discussions, there was some concern expressed about the province's current approach to planning for the next flood. Once the flood moved into the recovery phase, the decision was made that all reconstruction had to be done to a level of 1997 plus two feet. In

the absence of any other announced steps, the province's strategy appears to be to fight the next flood in the same manner as it fought the 1997 flood. For some people, this strategy is viewed as a recipe for the recurrence of the anxiety, anguish, social disruption, and economic turmoil that happened as a result of the 1997 flood. This interpretation of the inferred government strategy reflects the conviction that in the future there will be, based simply on the historical record, a flood that is substantially bigger in magnitude than the 1997 flood.

The approach of the province is considered short-sighted. Alternative or additional approaches should also be considered. The majority of the participants in the questionnaire would agree with this view. Questionnaire respondents strongly favoured land-use regulations and building codes. These choices are consistent with adopting an integrated management approach to the flood plain. Exactly what this means is unclear. However, what is clear is there is a need to develop flood plain management options for Red River Valley in Manitoba and to explore the social implications and economic benefits and costs that such options entail.

In conclusion, it is important that we do not forget the many positive events that happened during the flood. Outstanding community efforts worked to minimize the impact of the flood of 1997. There were truly heroic acts by many people in the valley. But effort alone is not sufficient. That effort needs to be channelled strategically and tactically. Managing such efforts is a complicated, exhausting task. Individuals and community decision-makers made hundreds of thousands, perhaps millions, of decisions. All were made with the best of intentions. The vast majority of them were good and were followed by positive outcomes; some were good decisions that failed to produce the desired effects; and a few of the decisions may have been counterproductive. In this report we have examined the outcomes of these decisions as perceived by the decision-makers. The recommendations in this section are offered in the hopes that they will lead to improvement to an emergency system that has many strong components to it.

VI. REFERENCES

- Abramson, L.Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based sub-type of depression. *Psychological Review*, *96*, 358-372.
- Barsalou, L. W. (1988). The content and organization of autobiographical memories. In U. Neisser & E. Winograd (Eds.), *Remembering reconsidered: Ecological and traditional approaches to the study of memory*. New York: Cambridge University Press.
- Dynes, R. R. (1993). Disaster reduction: The importance of adequate assumptions about social organizations. *Sociological Spectrum*, *13*, 175-192.
- Dynes, R.R. (1994). Community emergency planning; False assumptions and inappropriate analogies. *International Journal of Mass Emergencies and Disasters*, *12*, 141-158.
- Harvey, J. H., Ickes, W. J., & Kidd, R. F. (1976). *New directions in attribution research*. (Vol. 1). Hillsdale, NJ: Erlbaum.
- Quarantelli, E.L. (1997). Ten criteria for evaluating the management of community disasters. *Disasters*, *21*, 39-56.
- Rogge, J.R. (1992). A research agenda for disaster and emergency management. A report prepared for the United Nations Development Programme and the United Nations Disaster Relief Coordinator.
- Rossi, P. H., Wright, J. D., & Weber-Berlin, E. (1982). *Natural hazards and public choice: The state and local politics of hazard mitigation*. New York: Academic Press.
- Scanlon, J. (1996). The crucial role of the Mayor in Canadian emergency management. In R. T. Sylves & W. L. Waugh, Jr. (Eds.), *Disaster management in the U.S. and Canada: The politics, policy making, administration and analysis of emergency management*. Second Edition. Springfield, IL: Charles C. Thomas.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, *92*, 548-573.

Map 1

