

*Report on  
A Strategic Research Workshop on  
The Social Dimensions  
of the Flood of the Century*

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# *Report on A Strategic Research Workshop on The Social Dimensions of the Flood of the Century*

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At the request of the International Red River Basin Task Force, a strategic research workshop was convened on November 14, 1997 at the University of Manitoba. This report provides an overview of the goals of the workshop, and summarizes the deliberations of the individuals who participated in it. Particular emphasis is placed on the participants' recommendations to the Task Force for measures to be taken in anticipation of the next flood, and for research that is needed on the social dimensions of the 1997 flood.

## **Background to the Workshop**

On May 5, 1997, the governments of Canada and the United States agreed that a Task Force, appointed under a directive of the International Joint Commission, should "examine and report on the causes and effects of damaging floods in the Red River basin" and "make recommendations on means to reduce, mitigate and prevent harm from future flooding in the Red River basin." Over the last few months, the Task Force has been gathering preliminary data, largely of a technical nature, to inform its work. The Task Force has also conducted some consultations with people in the basin, which have highlighted the significant ways in which individuals and families, and home- and business-owners have been affected by the flood.

This workshop brought together a group of Canadian and U.S. researchers and service providers to explore and develop strategic recommendations on how to address the social dimensions of the 1997 flood. As detailed in the recommendations that follow, there is a clear need for systematic and comprehensive research into the various social dimensions of the flood. As well, there are many steps that should be taken by various levels of government in both countries, by non-governmental organizations providing services in the basin, and by individuals residing in the basin to ensure that the damage of future floods (and similar disasters) can be minimized to the greatest extent possible.

## **The Participants**

This workshop was by invitation only, with the participants chosen primarily on the basis of their experience during the 1997 flood (for example, as flood victims or service providers) and/or their expertise as social scientists working in the area of disaster research. An effort was made to achieve some parity between Canadian and U.S. participants (though a snow storm south of Winnipeg the night before the workshop meant that four U.S. invitees cancelled their plans to attend). Given that the workshop was intended to propose the parameters of a social research agenda, there were more academic researchers invited than community-based individuals.

The following individuals participated in the day-long workshop:

### **Canadian Participants**

Professor Tom Booth, Department of Botany, University of Manitoba

Dr. Booth is a member of the Disaster Research Institute and has been extensively involved in studies of disasters in Brazil. He is interested in the links between the social and environmental aspects of disasters. He and his family were evacuated during the 1997 flood.

Professor Jerry Buckland, Director of the International Development Studies Program, Menno Simons College, University of Winnipeg

Dr. Buckland has been doing research on how communities responded to the 1997 flood in southern Manitoba (with Dr. Rahman).

Professor J.M. (Jack) Bumsted, Department of History and Director of the Institute for the Humanities, University of Manitoba

Dr. Bumsted is the only flood historian in Canada. He has previously published a book-length monograph on the 1950 flood, and has a new book soon to be released, entitled *Centuries of Flooding*.

Susan Goyer, Re-entry Coordinator, North Ritchot Restoration Committee

Ms Goyer was one of many residents flooded in the basin (in 1996 and 1997). That experience, along with her training in family financial counselling and family studies, positioned her to take on the task of assisting approximately 500 families in North Ritchot in their resettlement and recovery following the 1997 flood.

Professor Karen R. Grant, Department of Sociology, and Associate Dean (Research), Faculty of Arts, University of Manitoba

Dr. Grant is a health sociologist whose research focuses on women's health. Her current research, with Dr. Higgitt, focuses on women's experiences of the flood, with a particular emphasis on the role that women play as "health guardians" in the home.

Professor John Gray, Department of Economics, University of Manitoba

Dr. Gray is an economist specializing in public finance and resource economics.

He is interested in the economic dimensions of the flood, and would like to revisit the methodology used in the 1958 Royal Commission on Flood Cost-Benefit, in order to assess its use in regards to the 1997 flood.

Professor C. Emdad Haque, Department of Geography, Brandon University

Dr. Haque is interested in human adjustments to disasters, including floods. He has previously conducted disaster research in Manitoba (floods and droughts) and Bangladesh (floods). He is currently conducting research on emergency preparedness among first nations populations.

Professor Nancy C. Higgitt, Department of Family Studies, University of Manitoba

Dr. Higgitt is a sociologist interested families and shelter environments, as well as the needs of vulnerable populations. She has previously conducted research on family resettlement of refugees, and low-income family mobility. She is currently conducting research (with Dr. Grant) on women's experiences of the 1997 flood.

Ray Hopke, Director of Emergency Social Services, Department of Family Services,  
Government of Manitoba

Mr. Hopke works in cooperation with various agencies throughout the province in the coordination and provision of social services during emergencies.

Valeria Hwacha, Director of the Disaster Response Planning Project, Salvation Army

Ms Hwacha is interested in vulnerable populations in disasters (e.g., women and children, first nations people). She is also interested in community development. These two areas are the focus of her M.A. thesis which is nearing completion, and her work with the Salvation Army.

David LeMarquand, Advisor to the International Red River Basin Task Force

Toni Morris-Oswald, Graduate Student, Natural Resources Institute, University of Manitoba

Ms. Morris-Oswald is currently conducting research on the psychosocial impacts of the flood of 1997.

Matiur Rahman, Research Associate of the Disaster Research Institute, University of Manitoba

Dr. Rahman is interested in examining, from a comparative perspective, how individuals responded to the flood. Previously, he has done extensive research on the human impacts of flooding in Bangladesh.

Professor Harun Rasid, Department of Geography, Lakehead University

Dr. Rasid is currently conducting research on lay preferences for flood prevention measures. Previously, he had conducted experimental surveys on lay preferences in Bangladesh and China. He spent part of this past summer conducting similar surveys in Manitoba and North Dakota.

Angela Sawh, Coordinator, International Services, Canadian Red Cross Society

Ms Sawh is responsible for the coordination for response and preparedness during disasters.

Professor Slobodan Simonovic, Member of the International Red River Basin Task Force, Professor in the Department of Civil and Geological Engineering and Director of the Natural Resources Institute, University of Manitoba

Dr. Simonovic's research interest is in modelling water resources decision-making. His current research involves developing criteria based on social and environmental impacts of the flood that can be employed in decision-making models.

Professor Brian Stimpson, Department of Civil and Geological Engineering, University of Manitoba

Dr. Stimpson is a specialist in the stability of rock structures in mining. Recently, however, he has been teaching engineering students about the various social impacts of technology.

Professor Robert W. Tait, Department of Psychology, and Acting Director of the Disaster Research Institute, University of Manitoba

Dr. Tait is interested in the short- and long-term psychosocial impacts of disasters, and the organizational styles of management involved in tactical responses.

Kate White, President of Black and White Communications and Member of the Canadian National Committee of the International Decade for Natural Disaster Reduction

Ms White has been involved in research on disasters for some time, and her particular interest is risk perception. She has developed the "RISK & Society" Schools Project which examines children's perceptions of risk. She is also interested in the economic and psychosocial dimensions of recovery from natural disasters.

Larry Whitney, Member of the International Red River Basin Task Force and Engineer with the Water Resources Branch of Manitoba Natural Resources

Professor Raymond Wiest, Department of Anthropology, University of Manitoba

Dr. Wiest, a research associate of the Disaster Research Institute, has conducted studies on disasters in Bangladesh, Mexico and Brazil. He is particularly interested in the impacts of disasters on families (particularly women and children).

## *U.S. Participants*

Bruce Carlson, Economist with the U.S. Army Corps of Engineers

Mr. Carlson is providing support to U.S. members of the International Red River Basin Task Force. He has extensive experience in flood damage reduction. He is also interested in environmental restoration in the wake of floods.

Professor Jay Leitch, Member of the International Red River Basin Task Force and Dean of the College of Business, North Dakota State University

Dr. Leitch is a resource economist who has done flood cost-benefit studies in Bangladesh and in the Red River basin.

Mary Fran Myers, Co-Director, Natural Hazards Research and Applications Information Center, University of Colorado

Ms Myers is interested in research comparing the flood damage reduction programs of Canada and the U.S.

Professor Wanda Olson, Department of Design, Housing and Apparel, University of Minnesota

Dr. Olson is a specialist in housing technology. She is involved in applied research on housing and, through the Minnesota Extension Service, is developing educational materials to assist health and housing professionals to deal with the problems of molds in homes in flooded areas.

Professor George O'Neill, University of North Dakota School of Medicine

Dr. O'Neill is a social psychologist whose interests in disasters derive from his personal experience of Hurricane Hugo. Subsequently, he was a disaster mental health responder for the Red Cross, and he staffed the Oklahoma City Hotline for children and parents. He has since conducted research on the psychological impacts of disasters on children.

Professor Kit O'Neill, Department of Psychology at North Dakota State University

Dr. O'Neill is interested in predictors of psychological distress in individuals in disasters, as well as the long-term psychological consequences of disasters. She is a volunteer for the American Red Cross, and teaches a course for the Society on disaster mental health services.

The four other individuals not able to attend the workshop were: Jim Belles, U.S. National Weather Service; Barbara Kramer, Northeast Social Services Center; Dave Loss, U.S. Army Corps of Engineers; and Janell Regimbal, Lutheran Social Services.

## **Workshop Objectives**

The specific objectives of this strategic research workshop were to:

1. identify lessons that have been learned from the 1997 flood;
2. determine goals (short- and long-term) for research into the social dimensions of the flood;
3. identify data requirements for social research on the flood;
4. develop a strategic plan for the coordination and conduct of a bi-lateral study; and
5. make recommendations for action by the Task Force, specifically related to research on the social dimensions and impacts of the flood, and related to future flood mitigation strategies in the Red River basin.

Objectives 3 and 4 could not be fully realized in the course of a day-long workshop.

In working toward achieving the other objectives, members of the workshop reviewed and reflected on issues such as:

1. what happened to the people in the basin?
2. how did people in the affected areas perceive their risk of flooding? how did such perceptions influence their actions? what were the consequences in terms of their adaptation and recovery?
3. what measures were taken on behalf of people in the basin before, during and after the flood? what indicators do we have of the success or failure of these measures (in the short- and long-term)?
4. what should be done in the future by governments and other organizations to deal with the threat of floods?

As a way of organizing our discussions, we considered three distinct, but related, periods that occur during any flood; i.e., the pre-flood/preparatory phase; the flood phase; and the post-flood/recovery and resettlement phase. Reference was also made to what is commonly referred to as “the disaster cycle” (or spiral) in our discussions. Finally, we noted the importance of keeping the perception of scale (i.e., global disasters, community disasters, individual disasters) in mind as we considered what needs to be done by individuals and governments.

As detailed in the recommendations that follow, there are several points at which interventions might be made to reduce the adverse effects of flooding in the future. Similarly, there is much research that can and should be done on the 1997 Red River flood, and flooding in the basin in general.

## The Recommendations to the Task Force

### I. What To Do for the Next Flood?

A number of recommendations were put forward by workshop participants. These are listed in broad categories.

#### *A. Flood Forecasting and Information Resources*

- A1. Forecasting water levels needs to be improved so that forecasts are believable. This is related to fostering a “trusted voice” in all aspects of flood preparedness.
- A2. There is a need for better communication between flood forecasters, and local officials and decision-makers. (The degree to which this was a problem may vary by locale. For example, this may have been less of a problem in Winnipeg than in parts of rural Manitoba and in North Dakota.)
- A3. The Task Force should explore the feasibility of unifying forecasting systems between the U.S. and Canada. (Some participants noted that this is likely impossible, given the differences in governance structures. Nevertheless, greater cooperation between Canadian and U.S. forecasters might assist populations in the affected areas, and facilitate flood preparedness activities.)
- A4. Forecasting information must be made accessible to the public. By accessible, we mean that the information must be communicated to all individuals likely to be affected by flooding, in a form which is understandable to them (i.e., in plain English, and in other languages, depending on the ethnocultural background of individuals in the affected areas), and which they can implement. It may be useful for forecasters (and flood managers) to liaise with agencies which specialize in the translation of technical language into accessible forms for laypersons.
- A5. Structures (and the corresponding technical and support staff) should be put in place in the long-term to help in the dissemination of flood information and forecasting information. (Information services or branches of governments may provide useful models.) Such services should work to determine: Who needs what information? How should that information be communicated to those needing it? As well, such services should determine how best to ensure that recipients of information know how to use it.
- A6. In addition to the information services noted in (A5), there should be clear information on who all of the “information brokers” are in a flood emergency. These resources and their contact coordinates should be made publicly available to all individuals residing in affected areas. One possible option is to establish an information hotline which can serve as an information broker for individuals requiring information and/or assistance.
- A7. Information is needed (before the flood) on how to recover from the flood.

**B. *Assistance to Local Government Officials***

- B1. Municipal leaders should be brought together to assess what happened in the 1997 flood – to have a dialogue about what worked well, and what did not work. Lessons learned from the 1997 flood should be used to inform future flood plans.
- B2. Municipal leaders should be fully informed about municipal by-laws relevant to flood preparations, and relevant fiscal matters.
- B3. There is a need to establish a “trusted voice” in local government in all phases of a flood emergency. It is, therefore, necessary that municipal officials be provided with the personnel, resources, and expertise that will be needed to fight a flood. (Most rural municipal governments involve few paid staff and some volunteer staff.) It should be remembered that, during a flood, many municipal government leaders and workers will also be fighting the flood on their own properties.

While respecting the autonomy of local governments, flood authorities should undertake to ensure that municipal leaders and workers have access to information and resources so that they can carry out their official duties related to the flood.) Such measures would go a significant way toward re-establishing (or establishing) trust in local officials.

- B4. Before the flood, there is a need to establish a clear chain of command. The chain of command should be clearly indicated to all officials and all residents in the basin.
- B5. It is necessary to identify who are the decision-makers in local jurisdictions throughout the valley. Workshops should be held to provide them with training in decision-making related to flood management. (It is important that such workshops also include individuals who were not involved in government/civic leadership roles so that this type of knowledge can be disseminated more broadly.)
- B6. In the post-flood stage, re-entry coordinators should be drawn from local communities. Their prior knowledge of the individuals and culture of their community will make their various tasks related to resettlement and recovery of residents easier. (This will also assist in empowering individuals and communities.)
- B7. Community leaders should be identified and engaged in activities to assist in recovery, resettlement, and future disaster planning.

**C. *During the Flood***

- C1. There should be a flood plan (fully articulated in advance), and it should be followed.
- C2. The military should be brought in to assist in flood-fighting at the earliest possible point.
- C3. Flood managers and service providers need to understand that there are many responses to warnings. Not everyone will perceive risks in the same way.

- C4. Municipal governments must ensure access to sand and sandbags, and coordinate these to the maximal benefit of individuals engaged in flood-fighting. (The same is true regarding the coordination of volunteers, if this is being carried out by local governments.)
- C5. Accessible and practical information on building dikes should be provided to individuals in affected areas, as well as contractors working in those areas.
- C6. There is a need for consistency in the mandate and operation of checkpoints during a flood. This is important both for residents and personnel staffing the checkpoints. (There are reports of individuals needing to get into their properties and facing inconsistencies in how they were processed through the checkpoints.)

***D. During the Evacuation Period***

- D1. There is a need to develop plans for large-scale evacuation. (In Manitoba, some 28,000 people were evacuated. If the evacuation had been larger, was a plan in place?)
- D2. Residents in the floodplain must have consistent information regarding evacuations and evacuation alerts.
- D3. Evacuation plans should include assessments of expectations regarding property (including livestock, farm equipment, etc.) and human lives. The feasibility and necessity of evacuation should be done with all of these factors in mind.
- D4. Consideration should be given to selective evacuation in the basin. (There have been several reports of individuals wanting to resist evacuation, but being forced to leave their properties, only to discover that their absence contributed to pump failures, and therefore breaches of dikes. In some cases, it is likely that properties would have been saved if individuals had been left to monitor their own properties.) Accordingly, it is necessary to determine who should be required to leave, and who can be permitted to stay, and under what conditions.
- D5. Retention of communities in evacuation may be very important for some populations (e.g., individuals sharing a common cultural heritage or language). Keeping communities together during the evacuation period may also facilitate the communication of flood information.
- D6. There is a need for procedures to help track individuals who have been evacuated. (The Red Cross had information only on people who registered.)
- D7. Debriefing of individuals involved in evacuation should be a high priority (e.g., health care workers, social workers, etc.).

***E. Flood Assistance in the Recovery Period***

- E1. Assistance needs to be made available to individuals so that they can move out of a recovery mode. This is essential now, so that these same individuals residing in the floodplain can prepare for the next flood, possibly in 1998. (It should be remembered that many individuals affected by the 1997 flood were also flooded in 1996. The cumulative disruptions and losses they have experienced are likely to be considerable, and thus may make their flood preparations for 1998 that much more onerous.)
- E2. Help should be provided to the helpers. This is especially important for individuals involved in re-entry work who may require assistance and supports, both material as well as psychosocial. (The Red Cross has debriefing programs which may be a useful model to adopt or adapt.)
- E3. A centralized database system containing the addresses/locations of properties and businesses, land elevations, diking information, etc. in the basin most affected by flooding should be established (and properly resourced). A database with this type of information would make it possible for flood managers and service providers to know what individuals are where, their flood histories, and flood protection measures. This type of database would also greatly ease the flood relief process, as well as recovery and resettlement of individuals, livestock, and businesses. This centralized registry would, not insignificantly, reduce costs and increase efficiencies, lessen the emotional burden experienced by flood victims who have had to provide the same information to multiple agencies and relief organizations, and may also reduce fraud. (There are many models of centralized registries that can be examined. Current computer systems allow for the creation of databases that ensure security of information, and offer ease in use.)
- E4. In keeping with the recommendation for a centralized registry, a case management system (or team approach) should be put in place to assist flood victims in the post-flood recovery period. Such a system should involve all key stakeholders and agencies providing services and relief to flood victims. Agencies involved in the case management system should have access to the centralized registry in order to facilitate flood relief/compensation and other aspects of resettlement and recovery. (One way to think of these case managers is as “Disaster Recovery SWAT Teams.”)
- E5. There should be coordination of agencies involved in the provision of services.
- E6. There should be coordination of agencies involved in assessing properties (this relates to orders to tear down versus restore homes, and the bureaucratic entanglements that may follow if agency representatives disagree).
- E7. Plans for re-settlement should be made in light of the causes of the disaster.
- E8. Wherever possible, disaster proneness should be reduced within the context of community development. Accordingly, it is necessary that an environment of mitigation take into consideration economic factors, environmental conditions, and human needs, desires and expectations.

***F. Future Flood Preparedness Activities***

- F1. Flood/disaster preparedness should be fully integrated into school curricula. It is necessary that efforts be put in place to train people to cope. The best place to start such a process is with children, by helping them to understand a “disaster subculture.”
- F2. For 1998, it is particularly important that teachers and students be given support as the anniversary of the 1997 flood approaches. This should be coupled with curriculum related to flood preparedness.
- F3. Individuals in the valley should be fully apprised of changing rules related to flood preparedness, and especially flood relief and compensation.
- F4. Communities, provinces and states should do pre-disaster planning for post-disaster recovery.

## **II. Research on the Social Dimensions of the 1997 Flood and Flooding in the Red River Basin**

1. The Task Force should make explicit what are the social dimensions of the flood. From this, research into the social dimensions should be commissioned.
2. The Task Force should specifically examine the implications of devolution on flood-fighting efforts in the valley. The effects on local governments as well as flood forecasting should be studied, with remedies proposed.
3. The Task Force should recommend to the International Joint Commission the establishment of a standardized methodology for tabulating the direct costs and losses of the 1997 flood, and flooding in the basin in general.
4. The Task Force should investigate the indirect costs and losses associated with the 1997 flood, so that these can be incorporated into any standardized methodology on the costs and losses associated with floods (see #3 above).
5. Comparative analyses of past research (in Canada, the U.S., and in Europe) should be conducted in order to identify “best practices” that can be incorporated into future disaster plans in the basin.
6. A centralized archive should be created containing information and research on the 1997 flood. Funds should be committed to maintain such an archive, to ensure the preservation of historical records on this flood (and any others in the future).
7. Research should be conducted on the following issues:
  - a. understanding the nature and extent of vulnerability of the people in the valley;
  - b. how do individuals perceive and react to flood information?
  - c. what was the effect on individuals of evacuation? did the site of evacuation influence recovery (e.g., were those placed in University residences better off than those placed in city hotels)? what was the effect of the wide dispersal of evacuees in North Dakota? under what conditions were cross-border evacuations necessary? what supports were needed/provided?
  - d. what are the benefits of occupying flood-prone lands?
  - e. what are the economic (and other) benefits of the 1997 flood?
  - f. what are the implications of event-driven nature of flood protection policies?
  - g. how do floodplain zoning and land-use management affect flooding?
  - h. how did charitable organizations do what they did, during the flood?
  - i. how did social agencies do what they did, during the flood?

These recommendations for research reflected which individuals were invited to participate in the workshop. As already noted, it is necessary that the Task Force articulate as fully as possible the social dimensions of the 1997 flood (see #1 above). The following may serve as a useful starting point. A social impact study should minimally include examining the following spheres (and related effects):

#### **ECONOMIC IMPACTS:**

- What is the impact of the flood on labour force activity/participation?
- How were businesses affected by the flood (closures, bankruptcies, improvements, etc.)?
- How were businesses affected by disruptions in the transportation sector?
- What is the economic impact of reconstruction in the wake of the 1997 flood?
- What is the economic impact of flood relief?
- What is the prevalence of personal bankruptcy among individuals in the floodplain, following the 1996 and 1997 floods?
- What is the effect of the flood on financial and retirement planning?

#### **PSYCHOLOGICAL IMPACTS:**

- What is the prevalence of conditions such as anxiety, depression, and stress-related conditions amongst individuals in the affected areas?
- What is the nature and extent of losses experienced by individuals in the affected areas?
- What is the nature of social supports available to individuals in the affected areas? In what ways did access to social support mediate the stressfulness of the flood?
- What methods of coping were used by individuals to deal with the stressfulness of the flood?
- What was/is the frequency of health care utilization in relation to psychological effects of the flood?
- How have “trauma teams” helped in the re-settlement period?

### **PHYSICAL HEALTH EFFECTS:**

- What is the prevalence of acute and chronic health conditions attributed to the flood and its aftermath?
- How do individuals rate their health before, during and after the flood?
- What was/is the frequency of health care utilization in relation to physical health effects of the flood?

### **ENVIRONMENTAL IMPACTS:**

- How did the flood affect internal air quality in homes? in public buildings in the affected areas?
- What methods of decontamination were used in the post-flood period? How did decontamination influence physical and psychological well-being?
- What other environmental impacts can be discerned in the affected areas?

### **SOCIOLOGICAL IMPACTS:**

- What are the variables related to people's decisions not to move out of flood-prone areas?
- How do we account for the effectiveness of people who have flood-proofed their homes?
- What is the impact of the flood on family and household units and relationships?
- What was the effect of displacement on individuals in the affected areas?
- How effectively were housing needs accommodated in the evacuation period and during resettlement? What were the housing needs?
- How did the flood affect community structures and functions? What was the effect of the flood on the sense of "community" in the affected areas?
- What was the role of shelters during the evacuation period and after?
- How (and how often) did individuals resist evacuation orders? With what consequences?
- What was the nature and effectiveness of relief efforts (including that provided by non-governmental organizations, churches, community groups, the military, etc.)? how did this vary before, during and after the flood?
- How pervasive is flight out of communities in the floodplain? What is the effect on the communities?
- What is the role of special interest groups during the flood period?
- How was risk communicated to, and understood by, individuals in the affected areas?
- What was the role of the media in communicating flood information (comparing print media, radio, television, and internet sites)?

Each of these, and other questions, should be included as part of a multi-layered, bi-national investigation of the social impacts of the 1997 flood.

### **III. Recommendations Regarding the Task Force Report**

Members of the workshop are keenly aware of how public events (such as the 1997 flood) lead to the establishment of commissions of inquiry. Regrettably, some commission reports are perceived to be politicized, and the result is the reports merely collect dust in government offices and public libraries. Similarly, members of the workshop are aware that there are many commissions investigating the 1997 Red River flood. In order to make this Task Force report most effective, we recommend:

1. That the Task Force thoroughly review what has been learned from past commissions of inquiry on floods in the valley, with a view toward establishing recommendations to the Canadian and U.S. governments and the International Joint Commission that will be acted upon. A review of past reports and commissions may help to clarify how this Task Force can inspire the kinds of remedial actions that are necessary for future flood-fighting activities and plans.
2. That the Task Force give consideration to what will happen if nothing is done, even in the light of its recommendations.

#### **Summarizing the Discussions of the Workshop**

As should be evident from this lengthy list of recommendations, there was a very broad-based discussion of many aspects of the social dimensions of the 1997 flood. Many of the recommendations dealing with practices and processes followed in the 1997 flood suggest research questions for consideration by the Task Force and researchers.

In addition to these specific recommendations, workshop participants engaged in lively exchanges about the central problems posed by the 1997 flood. The subjects of these discussions are summarized below.

The Gap Between Perception and Experience: Based on the experience of flood victims (as reported by individuals in the flooded area, and as reported by researchers who have conducted interviews in the basin), there is a gap between perception and reality. Public perception during the flood suggested, for example, good communication with individuals in the flooded area, a chain of command in the disaster plan, the effectiveness of the construction of dikes and other infrastructure, flood forecasting, etc. Not everyone in the affected areas felt that sufficient planning had been done pro-actively. Instead, some residents felt that flood managers were in a reactive mode during the flood. Similarly, people in the basin did not necessarily feel fully informed. Questions continue to be asked about decisions made regarding manipulation of the floodgates on the Red River Floodway, the building (and effectiveness) of the Brunkild Dike, the implications of blocking culverts, etc.

Sources of Expertise in the Basin: The flood of 1997, like other floods and disasters, was managed by a large number of experts, many of whom have technical training in fields such as water resources management and engineering. There is no question about the important role that such individuals played in controlling and/or managing this flood. Several members of the workshop noted, however, that other expertise exists in the valley – among those who reside and work in the valley – and this expertise is seldom tapped to the degree that it should be in developing and executing a disaster plan. At the heart of this issue is the difference between lay and expert knowledge, and the politics of incorporating non-expert knowledge into management decisions. This issue is not unique to the field of disasters. The consequence of excluding (or subordinating) lay knowledge in decision-making that affects so many people is that it may produce behaviours that place people and property at risk, and undermine efforts to prevent and control disasters.

The prevailing approach tends to focus on “top-down” decision-making. It was suggested that there is a need for “bottom-up” decision-making as well. Decision-making must be facilitated at the lowest level, to assist people in all phases of a flood.

Related to this, it must be recognized that the success of future mitigation strategies will depend on engaging the people affected in the flood-fighting effort. Putting some control in their own hands, as a form of empowerment, is an important vehicle for community development and disaster mitigation. This is a tried and true strategy used internationally in various fields (notably, public health). Increasing community capacity can only help in any future flood-fighting efforts. Involving communities in flood management will assist them to make informed decisions in the future.

It was suggested that social scientists may be able to help bridge the gap between lay and expert knowledge by developing models that incorporate different perspectives and approaches. Clearly, managers/decision-makers need to learn how to incorporate different types of knowledge into their planning. Public consultation is one way in which this can occur. As the Task Force does its work and prepares its reports, it should keep in mind the expertise in the basin. Individuals want and need their knowledge to be respected and given consideration.

The Need to Create a Disaster Subculture: Hannigan and Kueneman (1978: 131) refer to Moore’s description of a disaster subculture (1964) as “those adjustments, actual and potential, social, psychological and physical, which are used by residents of such areas to cope with disasters which have struck or which tradition indicates may strike in the future.” They note that like any subculture, one defined in relation to disasters is characterized by “norms, values, beliefs, knowledge, and technology, which take specific disaster subcultural forms.” Many aspects of our discussions focused on understanding the particular disaster subcultures in the valley (there is not one, but many, such subcultures, reflecting where and among whom people reside).

In order to manage future disasters, it is important that there be understanding at all levels of the nature of the disaster subcultures that exist, and how these affect people’s expectations and responses to an impending disaster. Understanding the subculture is key, as well, to any educational interventions designed to reduce future vulnerabilities in the valley.

As well, it is important that flood managers understand how their decisions will affect the disaster subcultures in the basin. There have been reports of insensitivity toward individuals living in the basin (including, but not limited to, Premier Filmon's remark that individuals need to take responsibility for living in the floodplain, and Mayor Susan Thompson's ringing of the bell to indicate the flood was over, when many evacuees in southern Manitoba had not yet been returned to their homes, much less restored their homes and businesses to pre-flood conditions). This insensitivity manifests itself in what some might call "big city-itis" (that is, an emphasis on large population centres to the detriment of smaller population centres).

Floods and Loss: There was extensive discussion of the losses that individuals experience during floods and disasters (e.g., distress, disruption, loss of property and possessions, altered social relationships, experiences of personal vulnerability, loss of control, loss of what is "normal," etc.). Physical losses are visible; very often social losses are not. One participant noted that "floods are about people, not water." If that is the case, then future disaster plans must put people first in every sense.

Understanding the Politics of Floods: There is no denying that floods are inescapably political in nature. What measures are taken, when and how are all decisions of a political nature. This must be understood in any future research and social policy related to flooding in the Red River basin. The problematics of the political nature of floods must be explored as part of the solutions that are sought for the basin. A substantial amount of our attention focused on the impact of "affected" populations. It is equally important that attention be focused on those who made/make decisions about flood planning, management, control and prevention. This includes all levels of government, in both countries, the tensions and conflicts between various levels of government, cutbacks and devolution in current government regimes, and all individuals involved in decision-making related to the 1997 flood.