Exploring the Links Between Individual and Social Learning in the Red River Floodway Environmental Assessment

By

Graeme L. Hayward

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

MASTER OF NATURAL RESOURCES MANAGEMENT

Natural Resources Institute
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THE UNIVERSITY OF MANITOBA

FACULTY OF GRADUATE STUDIES

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Abstract

In general, top-down expert-driven resource management approaches have proven to be ineffective when applied to problems that embody a high degree of complexity, uncertainty, and conflict. In Canada, and elsewhere in the world, there is a heightened level of interest in alternative resource management strategies and practices. The incorporation of meaningful public involvement and social learning opportunities is particularly important in resource management situations that run the risk of affecting various stakeholders. This research investigated the linkages between individual and social learning in the context of public involvement in environmental assessment (EA). The Red River Floodway EA provided an appropriate setting to investigate this issue in the general context of management for sustainability. Effective public involvement in EA can ensure that the project outcome reflects the values and interests of the communities involved.

Two groups were identified based on their involvement in the Floodway expansion EA. The Coalition for Flood Protection North of the Floodway (CFPN) is loosely structured, informal, and not very well funded. The Cooks Creek Conservation District (CCCD) is reasonably funded, highly formal, and well connected to the municipal and provincial governments. The research methods of this study were guided by the assumptions of a qualitative case-study approach. Face-to-face interviews, using open-ended questions, were the primary source of data.

Public involvement in EA provides an excellent opportunity for community organizations to engage in social learning about resource management activities that may potentially affect the natural environment and surrounding communities. Several factors contributed to the social learning outcomes that were achieved by the CFPN and CCCD. Both groups were transparent in their decision-making and idea-sharing processes. Furthermore, both the CFPN and CCCD possessed strong leadership within their organizations. Finally, both groups effectively documented their activities and provided opportunities for members to engage in dialogue throughout the EA process.

The evidence from this study suggests that doing an analysis of organizations participating in EA adds value and understanding to public involvement and how it is structured. It also adds value to understanding the communications and dynamics of groups participating in public involvement processes. Furthermore, this research recognizes the importance of identifying and addressing possible impediments to social learning in community organizations. Organizations that engage in social learning effectively will be capable of making informed decisions which may contribute to their success in public involvement forums.

Acknowledgements

The completion of this thesis would not have been possible without the overwhelming support of several key people.

I would like to thank my supervisor, Dr. Alan Diduck of the University of Winnipeg, for his motivation and guidance throughout this project. His patience and enthusiasm enabled me to overcome various obstacles on route to completing this thesis.

Thanks to Dr. Bruce Mitchell of the University of Waterloo for his valuable feedback and support. Thanks to Dr. Geoff Smith of the University of Manitoba for encouragement and insight during this research and my time on campus. Thanks to Dr. John Sinclair of the University of Manitoba for introducing me to this project and for providing valuable advice. Finally, I would like to express my gratitude to the staff at the Natural Resources Institute for their kindness and generosity.

I also thank the Social Sciences and Humanities Research Council of Canada (SSHRC) for financial support.

Above all, I thank my family and friends for their unconditional support. Sincere and special appreciation goes to my mother, Joanna, for her love and encouragement throughout this research.

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Chapter 1

Introduction

1.1 Background

Natural resource managers and decision makers are increasingly facing problems characterized by a high degree of complexity, uncertainty and conflict (Blatner et al., 2001; Mitchell, 2002; Blann et al., 2003; Diduck, 2004). Conventional resource management approaches have often failed to respond effectively to these types of problems (Cardinal and Day, 1998; Ludwig, 2001; Mitchell, 2002). Top-down, expert-driven management strategies have had limited success when applied to resource management practices or developments that affect various stakeholders and public interest groups (Ludwig, 2001). Currently, there is a heightened level of interest in alternative resource management strategies and practices.

In Manitoba and across Canada, various individuals and organizations are playing important roles in resource management decision-making processes. Environmental assessment (EA) at both provincial and federal levels provides opportunities for public involvement prior to any final decisions regarding proposed projects. Public involvement helps to ensure that the needs of the community are taken into consideration, while actualizing the principles of democracy (Gibson, 1993; Mitchell, 2002; Fitzpatrick and Sinclair, 2003). EA also provides an important opportunity for individuals and community groups to engage in learning (Webler et al., 1995; Saarikoski, 2000; Sinclair et al., 2002; Diduck and Mitchell, 2003).

Learning is a significant aspect of public involvement in resource management decision making. In particular, it is of vital importance for community groups to utilize public involvement opportunities in an effective manner to learn about development initiatives that may affect their well-being and seek out plans that promote sustainable resource management. In addition, organizations that are knowledgeable of management processes and related public involvement opportunities are in a better position to influence decision making.

Social learning approaches are increasingly being recognized by the resource management profession as holding potential for contributing to sustainable management practices (Parson and Clark, 1995; Alexander, 1999; Diduck, 2004). Social learning, as it applies to my research, is defined as learning by social groups or collectives (Parson and Clark, 1995). The EA of the Red River Floodway expansion provided an opportunity to explore important social learning issues. The focus of my research was concerned with the connections between individual and social learning. Moreover, the Floodway expansion EA provided an opportunity to investigate this issue in the general context of management for sustainability.

My rationale for investigating these issues was based on the following factors:

- my study will contribute to current research on social learning in EA, an emerging literature receiving considerable attention by academics and practitioners;
- the case study involved diverse and interesting learning opportunities (e.g., open-houses, workshops, and hearings);

- various organizations were participating in the EA;
- an organization that is able to obtain and process the knowledge of each individual member effectively will be better informed, thus leading to participation in EA that is both meaningful and of high value to decision makers; and,
- EA is inherently anticipatory and preventative in nature, and is targeted towards achieving sustainable outcomes.

1.2 Purpose and Objectives

This research investigated the linkages between individual and social learning in the context of public involvement in EA. The objectives were to:

1. identify what key individuals learned through their participation in the Floodway expansion EA;
2. identify what their groups learned;
3. describe the gap, if any, between what was learned by the individuals and what was learned by the groups;
4. explain barriers within organizations that may prevent or discourage mutual learning among individuals and their group;
5. develop a framework that seeks to explain how social learning contributes to meaningful public involvement; and,
6. provide recommendations on how to encourage social learning and improve public involvement in EA.

1.3 Methods

My research methods were guided by a qualitative case study approach. Two groups were identified based on their involvement in the Floodway expansion EA. The Coalition for Flood Protection North of the Floodway (CFPN) organization was established in 1999 by concerned citizens living along the Red River, north of Winnipeg (Figure 1). This organization is loosely structured, informal, and not very well funded. The Cooks Creek Conservation District (CCCD) was formed in 1979, to conduct conservation and resource management activities in an area immediately east of Winnipeg (Figure 1). This organization is reasonably funded, highly formal, and well connected to the municipal and provincial governments.

A literature review was conducted on social learning and public participation in EA. The main data collection techniques were a document review of government reports, newspaper articles, and records from non-governmental reports, interviews with EA participants, and observation of public meetings, open houses, and EA hearings. An examination of the data was performed using a qualitative analytical software package called NVivo 2.0.

1.3.1 The Red River Basin

The geographic study area is located in the Red River basin (Figure 1). The basin is prone to flooding on a regular basis. Spring flood events are common when there is heavy precipitation the previous fall, hard and deep frost prior to snowfall, substantial snowfall, sudden thaws, and heavy spring rainfall.

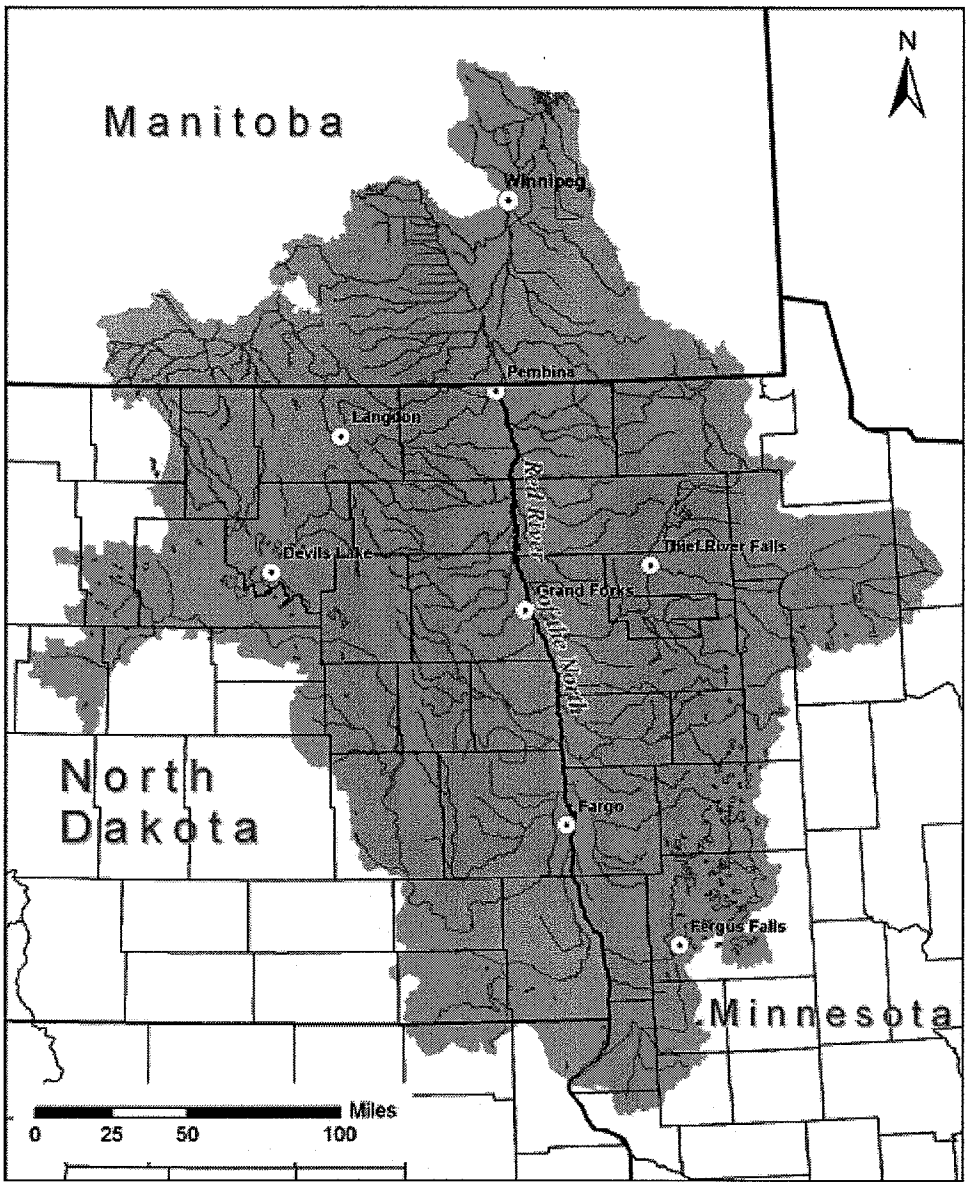

Figure 1 - The Red River Basin (Source: University of North Dakota, 2005)

The Red River is a large meandering river that originates in parts of Minnesota and North Dakota and flows north through southern Manitoba to an outlet at Lake Winnipeg. Throughout the Red River basin, the topography is relatively flat and the soil is fertile as a result of past glaciation (International Joint Commission [IJC], 2000). Excluding the Assiniboine River which joins the Red River at Winnipeg, the Red River basin covers

116,500 square kilometers and occupies a large amount of North Dakota, northeastern Minnesota, southern Manitoba, and a tiny portion of South Dakota (IJC, 2000).

The Red River basin is an area of relatively low relief. The vertical drop in elevation is only 70 meters over a distance of about 872 kilometers. The average slope of the river is about 0.15 meters per 1.6 kilometers (IJC, 2000). During a major flood event, water overflows the banks of the river and inundates the entire floodplain (IJC, 2000). The climate of the Red River basin is sub-humid/humid continental. Extreme temperature changes are experienced from season to season. Winters are frigidly cold, while summers are moderately warm. Daily fluctuations in temperature can also be extreme. Average yearly precipitation is approximately 500 millimeters, with the bulk of it occurring in late spring and summer (IJC, 2000).

Flooding in the Red River basin has been documented on many occasions throughout the nineteenth and twentieth centuries. Most flooding occurs after there has been heavy precipitation the previous fall, hard and deep frost prior to snowfall, substantial snowfall, sudden thaws, or heavy rainfall during spring break-up (IJC, 2000). The most notable Red River flood events in Canadian history occurred in the years 1776, 1826, 1852, 1861, 1916, 1950, 1979, and 1997 (Bumsted, 1997). The flood of 1826 is the largest of the floods on record. Contributing factors included: heavy precipitation, a sudden spring thaw, and ice jams on the river (Bumsted, 1997). In summary, the most influential factors contributing to flooding of the Red River basin include:

- gentle sloping landscape;
- low soil permeability;
- long/cold winters with high precipitation;
- saturation of soil prior to fall freeze-up;
- sudden spring thaw;
- ice jams within the river system;
- spring snow storms; and,
- land use practices

The people at highest risk of flooding are in both rural and urban settlements (IJC, 1997; IJC, 2000). Population density varies from just a few hundred people per square kilometer, to thousands of people per square kilometer (IJC, 2000). The largest population clusters in the United States are located in the Fargo/Moorhead and Grand Forks/East Grand Forks urban nodes. However, the largest urban population of the floodplain is located in Winnipeg, Manitoba at the junction of the Red and Assiniboine Rivers.

Flood protection measures implemented by both the Canadian and American governments have focused on a combination of structural and non-structural measures (Morris-Oswald et al. 1999). Of notable mention is the flood of 1950 which marked the beginning of financial contributions by Canadian provincial and federal governments for the purpose of flood relief restoration (Bumsted, 1997). The flood of 1950 was also significant because it initiated the development of large-scale structural flood prevention

measures. The most notable of these projects were the Red River Floodway, Portage Diversion, and the Shellmouth Dam (Emergency Preparedness Canada [EPC], 1999). The Red River Floodway is a large excavated channel, constructed for the purpose of diverting water around the city of Winnipeg.

The Floodway has been used on several occasions since it was completed as a form of flood protection for residents located within Winnipeg (EPC, 1999). Of particular note was the flood of 1969. The Floodway succeeded in preventing flooding in Winnipeg, but residents located just south of the Floodway inlet claimed to have suffered worsened flooding because of the operation of the Floodway (EPC, 1999). This event added to the continuing conflict over perceived inequities of protection between Winnipeg residents and non-residents that still persists today (Morris-Oswald et al. 1999).

The flood of 1997 was significant because it tested the Floodway to its absolute limits (IJC, 2000; Kontzamamiz-Graumann-Smith-Macmillan Incorporated [KGS], 2000). For the most part, the Floodway succeeded in preventing any major flooding to the City of Winnipeg, but the structure just barely held back the floodwaters. It became apparent to the authorities responsible for flood management that there was a need for measures to increase the level of protection for residents of Manitoba. The governments of Canada and the United States asked the International Joint Commission (IJC) to conduct research concerning the causes of the flooding and recommend ways to reduce the impacts of major floods (IJC, 2000). The IJC established the Red River Basin Task Force to

undertake a number of studies related to flood risks in the basin and possible means to reduce those risks.

This led to a Government initiative to increase flood protection measures for the City of Winnipeg and communities in rural Manitoba. An independent engineering group was commissioned to research and identify the best options for flood protection. In a document titled the *'KGS Report'*, the consultants recommended two main structural projects that would increase considerably the level of flood protection for Winnipeg. One option was to build a complex of dams and channels just south of Ste. Agathe, and the other option was to increase the capacity of the existing Floodway structure (Kontzamamiz-Graumann-Smith-Macmillan Incorporated [KGS], 2000). Further investigation determined the Floodway Expansion Project to be the best option. This triggered a joint Federal/Provincial environmental assessment for the proposed project.

The Red River Floodway is one of three flood protection measures constructed in the basin during the late 1960s. The Floodway is a large excavated channel, designed to divert water around Winnipeg. Following the major flood event in 1997, the Manitoba Government decided to expand the Floodway. In March, 2004, the Province introduced legislation, creating an agency (The Manitoba Floodway Authority [MFA]) to oversee the expansion of the Floodway. Complying with provincial and federal legislation, the MFA conducted an environmental assessment in which opportunities were provided for public consultation. The proposal to expand the Floodway involved widening the Floodway

channel, modifying and replacing bridges and utilities, and making improvements to the inlet and outlet control structures (Clean Environment Commission [CEC], 2005).

1.4 Thesis Organization

The thesis is organized into six chapters. The first chapter introduces the research and provides a rationale for linking social learning to the Floodway expansion EA. The second chapter reviews the relevant literature on natural resource management, social learning, and public involvement in EA. Emphasis is placed on describing social learning and linking concepts to practice. The third chapter outlines the research methods, including a rationale for group selection and background on the two groups chosen for the study. The fourth chapter provides a description of the Floodway expansion EA, and identifies what individuals have learned as a result of their involvement. The fifth chapter investigates the linkages between individual learning and social learning. A description of organizational memory and social learning is also provided. The sixth chapter explores ways that social learning can contribute to resource management and provides recommendations and conclusions.

Chapter 2

Review of Relevant Literature

2.1 Introduction

This chapter presents a review of several relevant bodies of literature. The chapter provided the basis for my research proposal, but it expanded and evolved as fieldwork began and data were collected and analyzed. The first section explores areas of resource management that display a high degree of complexity, uncertainty and conflict. Next, an overview is provided of some of the social learning approaches that have contributed to addressing these issues in the search for sustainability. Furthermore, social learning, as it applies to my research, is defined and the linkages between individual and social learning are investigated. Finally, public involvement in EA and the associated opportunities for social learning are then explored.

2.2 Complexity, Uncertainty And Conflict

Locally, and all over the world, natural resource managers and decision makers are facing problems characterized by a high degree of complexity, uncertainty and conflict (Cardinall and Day, 1998; Blatner et al., 2001; Mitchell, 2002; Diduck, 2004). Conventional resource management approaches tend to focus on expert-driven solutions and typically have limited opportunities for public access to the decision-making process. However, scientists and managers must be prepared to recognize their limitations and acknowledge the role that values play in their recommendations (Ludwig, 2001). The

failure of conventional management practices to respond and adapt to the challenges of modern resource-related problems has contributed to an intensified search for alternative approaches.

The complex nature of ecosystems and the implications of uncertainty are commonly cited throughout the literature. Hartvigsen et al. (1998: 427; 429) described ecosystems as "complex assemblages of interacting organisms embedded in an abiotic environment", and went on to conclude that the "ability of ecosystems as a whole to respond to perturbations such as changes in climate and declines in biodiversity is difficult to predict". In a paper that discussed some of the challenges for justifying and designing experimental management programs, Holling (1990: 2067) stated that "not only is the science incomplete, the system itself is a moving target, evolving because of the impacts of management and the progressive expansion of the scale of human influences on the planet. Hence, the actions needed by management must be ones that achieve ever-changing understanding as well as the social goals desired."

Conflict can result when competing values and views exist among various stakeholders. Cardinall and Day (1998) noted that conflict can arise when resource managers are confronted with decisions that will affect various stakeholders. In this context, it is essential for resource managers to consider multiple values and interests right through the decision-making process. "The ability to cope with diverse values and uncertainties is an essential attribute of competent environmental management and planning" (Cardinall and Day, 1998: 110).

Resource management practices of the past have largely been based on expert-driven research and have often been criticized by social scientists for failing to include the public in a meaningful way throughout the decision-making process. Ludwig (2001) argued for a new approach to managing for complicated problems characterized by uncertainty and complexity. He used the term *'wicked problems'*, as defined by Rittel and Webber (1973), to describe problems that have no definitive formulation, no stopping rule, and no test for a solution. "There are no experts on these problems, nor can there be. Instead, we should establish and maintain a dialogue among the various interested parties" (Ludwig, 2001: 763). In conclusion, Ludwig acknowledged that there needs to be more dialogue among interested parties, and a shift away from science-driven solutions to complicated environmental problems. Social learning approaches are now recognized as valuable tools to deal with these kinds of resource management problems. Social learning approaches cope with uncertainty and conflict by emphasizing dialogue, mutual learning, and the continual evolution of ideas.

2.3 Social Learning

The theoretical basis of this study is embedded in social learning. A brief overview of social learning is presented below. The first part identifies and describes some of the key contributors to social learning literature, while the remainder of the section links the key concepts to my research.

Modern social learning ideas developed and evolved out of the philosophical writings of education theorist John Dewey (Friedmann, 1987; Parson and Clark, 1995). Dewey's theory of social learning proposed that all valid knowledge is derived from an individual's past experience. "It is conversion of past experience into knowledge and projection of that knowledge in ideas and purposes that anticipate what may come to be in the future and that indicate how to realize what is desired" (Dewey, 1963: 50). Dewey's conceptual framework emphasized the importance of *'learning by doing'*, and suggested that it is through this learning process that people come to understand the world and take action to transform it. For Dewey, experience is the basis for all knowledge.

Creighton (1999) noted that *'learning'* is one of the most logical, natural, and effective tools to assist with adapting to unanticipated events and surprises. Organizations which learn effectively will have greater success in reaching their goals and objectives (Parson and Clark 1995). The notion of *'learning from experience'* is commonly expressed in many of the social learning definitions in the literature (Dewey, 1963; Argyris, 1977; Dixon, 1993). Action enables learning, and through that learning knowledge and understanding are accrued (Dewey, 1963; Merriam and Caffarella, 1999).

Friedmann (1987) examined social learning from a planning perspective and described the historical underpinnings of the concept. He conceptualized social learning by first defining *'action'* and then explaining what an actor is. Following this, he explored who participates in the learning process and described the principal modes in which learning

occurs. Finally, he attempted to answer the question of whether or not theory was involved in the social learning process.

'Action' was defined *as* "purposeful activity undertaken by an actor-individual or collective within the actor's environment" (Friedmann, 1987: 183). Learning generally results from the acquisition of knowledge through the process of trying to overcome some sort of resistance. The actors involved in social learning may consist of individuals, small groups or larger collectives. But, for Friedmann (1987: 185) the "principal focus of the social learning approach is the task-oriented action group, a dynamic, interactive totality involving fewer than a dozen participants, the smallest group being a dyad of two persons". Social learning is an experiential process that results from the actions taken by a group (Friedmann, 1987).

Friedmann identified three principal modes of learning. The first manifests itself as a change in practical activity, and is characterized as a type of tacit or informal learning. The second mode involves learning influenced by so-called change agents who encourage and guide actors in the process of changing reality. Professional trainers or consultants, for example, may provide and distribute a type of formal knowledge to the group. The final mode of learning may take the form of either single- or double-loop learning. A detailed discussion of single- and double-loop learning will be provided later in the chapter. For now, it can be noted that single-loop learning involves changes in a group's tactics or strategies of action to solve a given problem, and double-loop learning involves a change in an actor's theory of reality, values, norms, and beliefs.

Does social learning require theory? For Friedmann (1987: 186), "all learning requires theory, where theory is understood as a set of categories that will guide practice and help to process information generated in the course of the action itself". According to Friedmann, the two kinds of theory involved in social learning are a theory of reality, and a theory of practice. The theory of reality is further divided into (1) a theory of history and (2) a theory of situation. The theory of history relates to how an actor is inclined to view the world. The theory of situation relates to an actor's understanding of a given situation. Theories of practice are sets of expectations about appropriate behavior (Friedmann, 1987).

Friedmann (1987: 186) concluded his discussion by stating that "knowledge of reality and of practice exert a mutual influence on each other". Theory is formed from a combination of an actor's evolving experience and prior learning.

The concept of social learning has evolved from many of the same principles that apply to individual learning, but social learning is widely recognized as a distinct type of learning. Parson and Clark (1995: 439) stated that any discussion of group learning "implies one of two forms of relationships between individual learning and changes taking place in the aggregate". The first relationship is termed *'decomposition'* and describes group learning as the sum of the learning by the group's constituent individuals. What each individual learns may be contingent on the choices and learning of other group members. Or, the means of individual learning might be through activities that depend

on the participation of other group members. The second relationship is termed *'analogy'* and describes group learning as autonomous, determined by group level causal processes that correspond to the processes shaping individual learning. Discussion of the differences between individuals and organizations led Parson and Clark to conclude that in addition to learning through direct experience, individuals and organizations have the ability to learn from observing others. For instance, an organization may model its approach and tactics towards engaging in dialogue with an authority on the basis of actions employed by other organizations in similar settings.

My research is within Dewey's tradition of learning by doing, is consistent with Friedmann's conception of task-oriented organizations, and adapts a variation of Parson and Clark's decomposition analytic framework. However, my research is also specifically grounded in the *'Theory of Action'* perspective put forth by Argyris and Schön in the 1970s. They argued that people possess mental maps that are used to determine how to act in a given situation (Argyris and Schön 1978). Further, they believed that the maps that guide people's actions are not the same as the theories that they espouse. Basically, there are two theories of action: the one which people openly describe to others when asked (espoused theory) and the one that actually guides people's actions (theory-in-use) (Argyris and Schön 1978).

In their model, Argyris and Schön described three interacting elements or stages: (1) governing variables - those dimensions that people try to keep within acceptable limits; (2) action strategies - the moves and plans used by people to keep their governing values

within the acceptable range; and (3) consequences - what happens as a result of an action. These can be intended or unintended. The theory-in-use is confirmed when the result of an action is what the person desired (Argyris, 1977). In this case, there is a match between intention and outcome. There may also be a mismatch between intention and outcome or the result may not coincide within the person's overlying values.

For Argyris and Schön, social learning involves the detection and correction of error (Figure 2). Single-loop learning occurs when there is a match or mismatch between intention and outcome. The learning that takes place enables the organization to continue to operate under the context of its original policies and norms. "Single-loop learning can be compared with a thermostat that learns when it is too hot or too cold and then turns the heat on or off" (Argyris, 1977: 116). Double-loop learning, on the other hand, occurs when the overlying policies and norms are brought into question. This type of learning can only occur when there is a mismatch between intention and outcome. "If the thermostat could question itself about whether it should be set at 68 degrees, it would be capable not only of detecting error but of questioning the underlying policies and goals of its own program" (Argyris, 1977: 116).

The notion of organizational memory forms the entry point for my investigation of the linkages between individual and social learning. The theory of action perspective describes individual learning as a necessary but insufficient condition for social learning. For social learning to occur, individual knowledge (discoveries, inventions, evaluations) must first be embedded in organizational memory. The learning that takes place may be

stored in the form of private memory (e.g., mental models, visions, generalizations) or public memory (e.g., legislation, organization charts, diagrams, management plans, mandates).

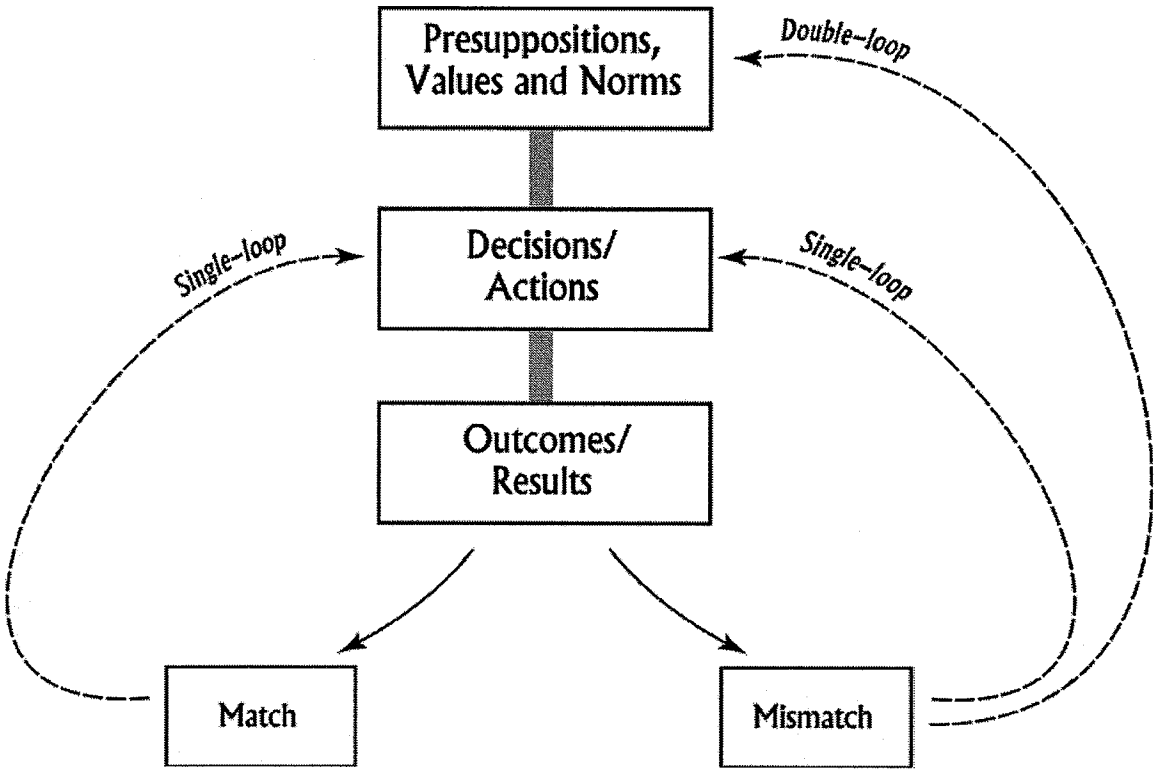

Figure 2 – Single- and Double- Loop Learning: Detection and Correction of Error (Source: Diduck et al., 2005, after Argyris, 1993)

The organization is not capable of learning until individual memories have been encoded in the images or maps constructed by organizations and their members (Argyris and Schon, 1978). Of course, a problematic issue is distinguishing between individual memories and collective memories of the private type. For the purposes of this research, individual memories became private collective memories when they represented consensus views (mental models, images, opinions, etc.) of a majority of group members.

Consensus views may or may not result in collective action that initiates new learning opportunities (Figure 3).

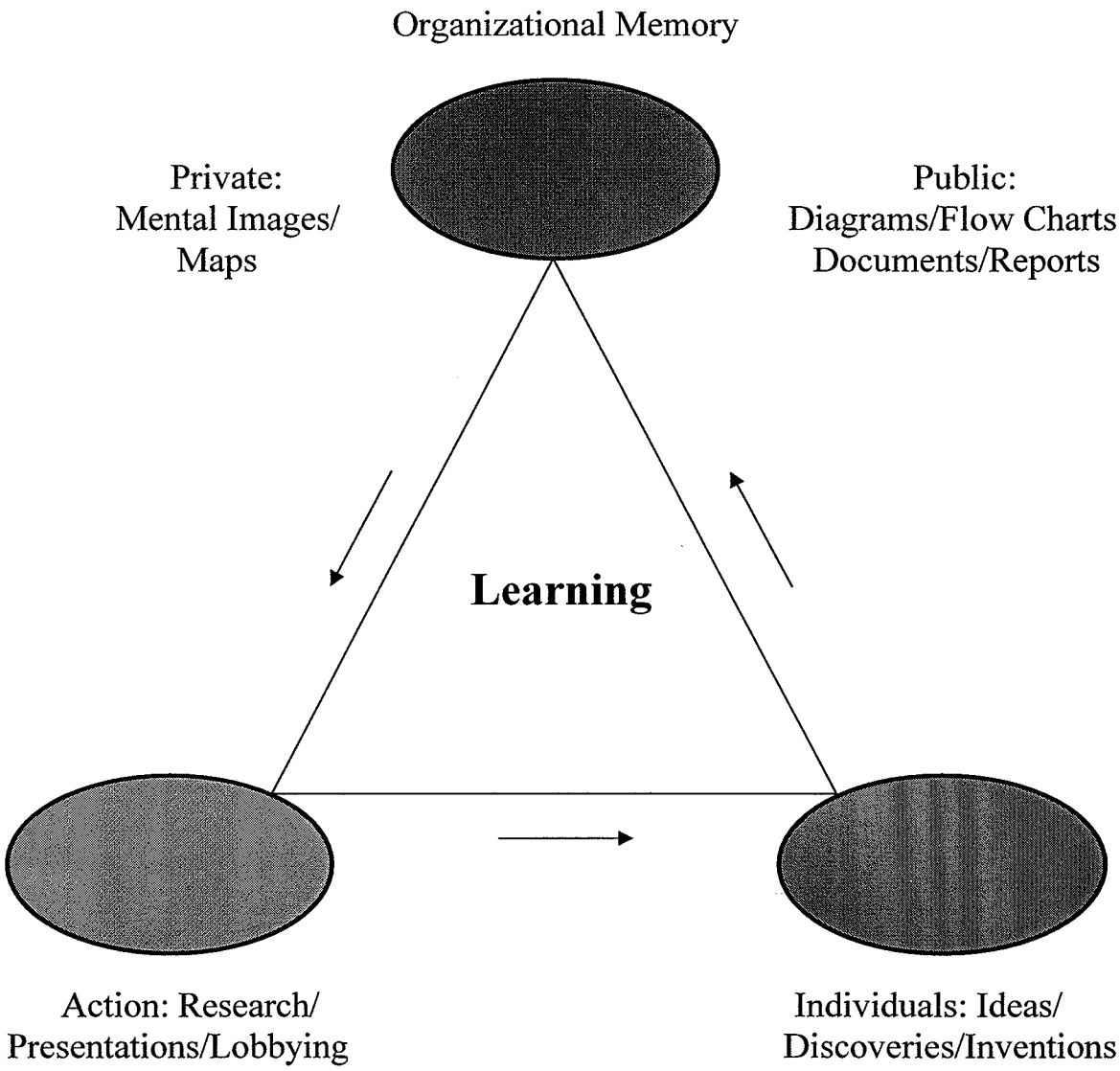

Figure 3 – Formation of Organizational Memory
Organizational memory is formed when individual learning is embedded in the private and public memories of the organization. Organizational learning may involve organizational action (actualized by individual agents of the organization) founded on organizational memory. Action can result in new individual knowledge, which can be embedded in organizational memory, thus renewing the learning cycle.

Investigating the linkages between individual and social learning is important because it can contribute to the overall knowledge of an organization, which in turn may contribute to meaningful public involvement in resource management. An organization that is able to transmit knowledge effectively from an individual member to the entire group will be able to make informed decisions about proposed projects that may affect their well-being. Barriers may exist within the organization that impede or prevent the transmission of knowledge from an individual level to a group level. For example, desired learning outcomes may be difficult to achieve if the group is unaware of the strengths and weaknesses of individual members. Listed below are several possible impediments or barriers that may prevent or inhibit the transmission of individual knowledge to the organization (Argyris, 1977; Argyris and Schon, 1978; Senge, 1990):

- absence of transparency within the structure of the organization;
- overly dominant leadership or lack of leadership;
- lack of organizational structure;
- inadequate opportunities for members to engage in dialogue;
- deficient communication network;
- insufficient funding to participate in public involvement opportunities;
- time constraints;
- deficient documentation;
- unresolved conflict among group members; and,
- learning difficulties among group members.

2.3.1 Environmental Assessment

Social learning concepts have been integrated into various resource and environmental management applications. For example, social learning provided a theoretical basis for learning that takes place by institutions engaged in environmental policy making (Parson and Clark, 1995; Haas, 2000; Fiorino, 2001). Further, social learning concepts have been applied to environmental education programs (Krasny and Lee, 2002). Krasny and Lee used a social learning approach to evaluate the results of an education program concentrating on non-indigenous species in New York State. Social learning is also increasingly being used in specific resource management sectors (e.g., forestry and water resource management) in an attempt to replace conventional top-down approaches (Pahl-Wostl, 2002).

My research will apply social learning ideas in an EA context. EA provides an excellent opportunity to investigate the connections between individual and social learning in the general context of management for sustainability. A goal of EA is, generally, to achieve outcomes that are consistent with sustainable development (Gibson, 1993; NRTEE, 1993; Lawrence, 1994; Diduck and Mitchell, 2003). EA is inherently anticipatory and preventative in nature and is therefore well suited as a tool for achieving sustainability (NRTEE, 1993). Further, the various public interest groups and stakeholder organizations actively participating in the Floodway expansion EA provide opportunities to explore individual learning in the context of social collectives.

In Manitoba, approvals and licensing must be obtained in compliance with two key statutes before development can take place: '*The Manitoba Environment Act*' (1988) and the '*Canadian Environmental Assessment Act*' (CEAA) (2003). Both of these acts set out specific requirements that must be fulfilled before licensing approvals can proceed. One of the purposes stated in Section 4 of the CEAA is to "*ensure that there will be opportunities for timely and meaningful public participation throughout the environmental assessment process*". In addition, any advisory committee will be required, under Section 6 (1) (b) of the Manitoba Environment Act, to "*develop and maintain public participation in environmental matters*". As set out by the *Canada-Manitoba Agreement on Environmental Assessment Cooperation*, a joint provincial-federal review process can be applied to any developments that trigger an assessment at both provincial and federal levels.

2.3.2 Public Involvement

The ideal characteristics for meaningful public involvement have been described thoroughly in the literature. Effective public involvement processes normally incorporate some or all of the following attributes: early and ongoing opportunities for public participation; various public involvement opportunities; decision-making processes that are transparent and inclusive; adaptive and flexible techniques; and, situations that promote conflict resolution (Webler et al., 2001; Haque et al, 2002).

The value of public involvement in EA has increasingly gained recognition in the resource management community (Gamble, 1978; Roberts, 1995; Palerm, 2000). It

provides a forum for the use and integration of local and traditional knowledge, allows for comprehensive planning and decision making, and facilitates a transparent process (Webler et al., 2001; Fitzpatrick and Sinclair, 2002 Sinclair and Diduck, 2005). Public involvement in EA ensures that the purpose and design of proposed projects reflect the needs of the public, while actualizing the principles of democracy (Webler et al., 1995; Palerm, 2000; Fitzpatrick and Sinclair, 2002). Further, public involvement opportunities in EA assist in the establishment of practical conflict resolution venues within which learning can take place (Sinclair and Diduck, 2001; Diduck, 2004).

Gibson (1993) argued that public involvement is necessary because EA is a process of mutual learning. Learning can take place among all participants involved in resource management activities (Diduck, 2004). A heightened understanding of each other's interests and views can be achieved through mutual learning, which in turn can result in resource management decisions that are more likely to be embraced and accepted by all participants. EA is often characterized by a high degree of complexity, uncertainty and conflict. Meaningful public participation opportunities are required to address issues of conflict and uncertainty that arise when various values and interests are at stake (Gibson, 1993; National Round Table on the Environment and the Economy [NRTEE], 1993; Sinclair and Diduck, 2001). Natural resource management practices that incorporate the values and beliefs of stakeholders are likely to be sustainable over time.

2.4 Summary

Individual learning is a necessary but insufficient condition for social learning. Before social learning can occur, knowledge must first be embedded in the collective memory of the group. In this sense, social learning is dependent upon the formation of organizational memory which is evident in the consensus view of the majority of group members. Social learning may or may not result in collective action. However, collective action is often an indicator of social learning. Organizations that are able to learn and process information effectively will be better equipped to influence decision makers and ensure that their values and interests are taken into consideration. Effective public involvement in EA can ensure that the project outcomes reflect the values and interests of the communities involved by providing meaningful learning opportunities.

Chapter 3

Methodology

3.1 Philosophy and Overall Approach

My research approach is consistent with the assumptions of a qualitative paradigm. "A paradigm, an idea made famous by the philosopher of science Thomas Kuhn (1970), means a basic orientation to theory and research" (Neuman, 2003: 62). Creswell (1994) described assumptions, based on ontological, epistemological, axiological, rhetorical, and methodological aspects:

- reality is subjective and constructed by individuals involved in the research situation;
- there is direct interaction between the researcher and what is being researched;
- there is a value-laden property of the study;
- the language is personal and informal; and,
- the methodology is based on inductive logic.

Given the overall purpose of my thesis (to investigate individual and social learning and the links between the two), a qualitative approach founded on the above assumptions was appropriate.

3.2 Research Design

My research design followed a qualitative, comparative case study approach. According to Yin (1994), case studies are a preferred research strategy in situations where the boundaries between phenomenon and context are not easily differentiated. A case study approach was ideal for this thesis because "how" and "why" questions were asked, I had little control over what was being studied, and the focus of the research concerned a current issue within a real-life setting.

As with the case selection described in chapter 1, the group selection process was directed by several criteria. My case studies focused on two organizations that were involved in the Floodway expansion EA. The Coalition for Flood Protection North of the Floodway (CFPN) and Cooks Creek Conservation District (CCCD) were selected for various reasons. These groups provided opportunities for cross-case comparison. As well, they were approachable and accessible. Of the two groups, CCCD was formally structured and had well-established decision-making guidelines, while CFPN was less structured and more informal. Furthermore, both groups were well established, and exemplified a high degree of commitment to participating in the EA. Finally, the groups were chosen because they were suitable for investigation in the context of a larger project of which my work is one component. The broader project involves a comparison of public involvement and social learning in the Floodway expansion EA and in land use planning of the Oak Ridges Moraine, north of Toronto (Figure 4).

Members from both groups were selected for interviews using a form of purposeful sampling which involved deliberately selecting key informants (Maxwell, 1996). Individuals were initially identified by examining EA documents and through direct observation at public involvement events. However, most individuals were identified by querying other members throughout the interview process. These methods were useful because the groups were relatively small and the members were not easily identifiable.

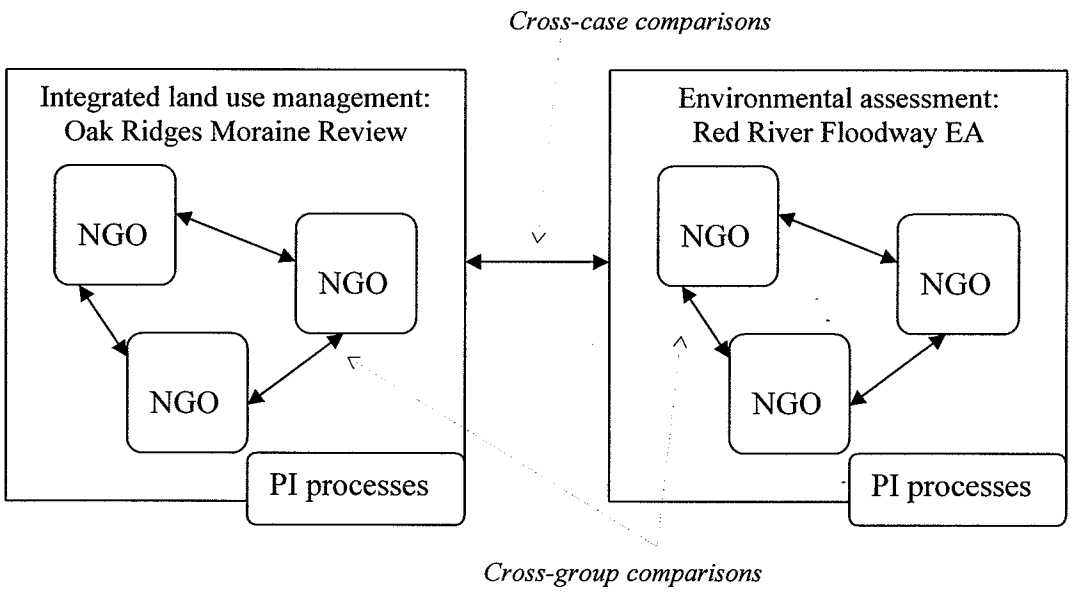

Figure 4 – Case Study Design:
Public Involvement (PI) of Non-governmental Organizations (NGO)

3.2.1 Group Descriptions

The CFPN was established in 1999 by a group of concerned citizens. At the time of its formation, an executive board of twelve volunteers was created to make decisions on behalf of all interested members. Group membership varies, and meetings held in the past few years have attracted upwards of fifty individuals. This loosely structured

organization mainly consists of middle-aged and elderly residents living in an area north of the City of Winnipeg along the Red River (Figure 5). The CFPN received $50,000 in intervener funding from the MFA and raised additional finances through three rural municipalities. Members of this group communicated regularly by attending group meetings, emailing and using the telephone.

The CFPN is concerned that an expanded Floodway may pollute groundwater resources (Observation Notes, February 14, 2005). Having conducted research using their own expert witnesses, they became aware of contaminated water in the Floodway. Further investigation revealed that sewage from the City of Winnipeg was being released into the Floodway system. Many members of the CFPN have also expressed concern over the potential for increased ice jamming due to the discharge of water from the Floodway prior to ice breakup (Observation Notes, February 24, 2005). It is their belief that an increased capacity of the Floodway will exacerbate these conditions, and contribute to flooding north of the outlet. This group recommended that action be taken to prevent the possibility of groundwater contamination, and compensation and flood protection measures be implemented for residents located downstream of the Floodway outlet.

The CCCD was established in 1979, to conduct conservation and resource management activities east of the Floodway in the Cooks Creek Area (the rural municipalities of Springfield, Tache, Ste. Anne, Reynolds and Brokenhead) (Figure 5). This formally structured organization consists of members of various ages and socioeconomic backgrounds. The CCCD received $35,000 in intervener funding from the MFA and

generated an additional $35,000 through local government. The District Board is responsible for hiring a staff to deliver programs and to conduct financial management. Resource management plans are developed in consultation with the local ratepayers and provincial partners.

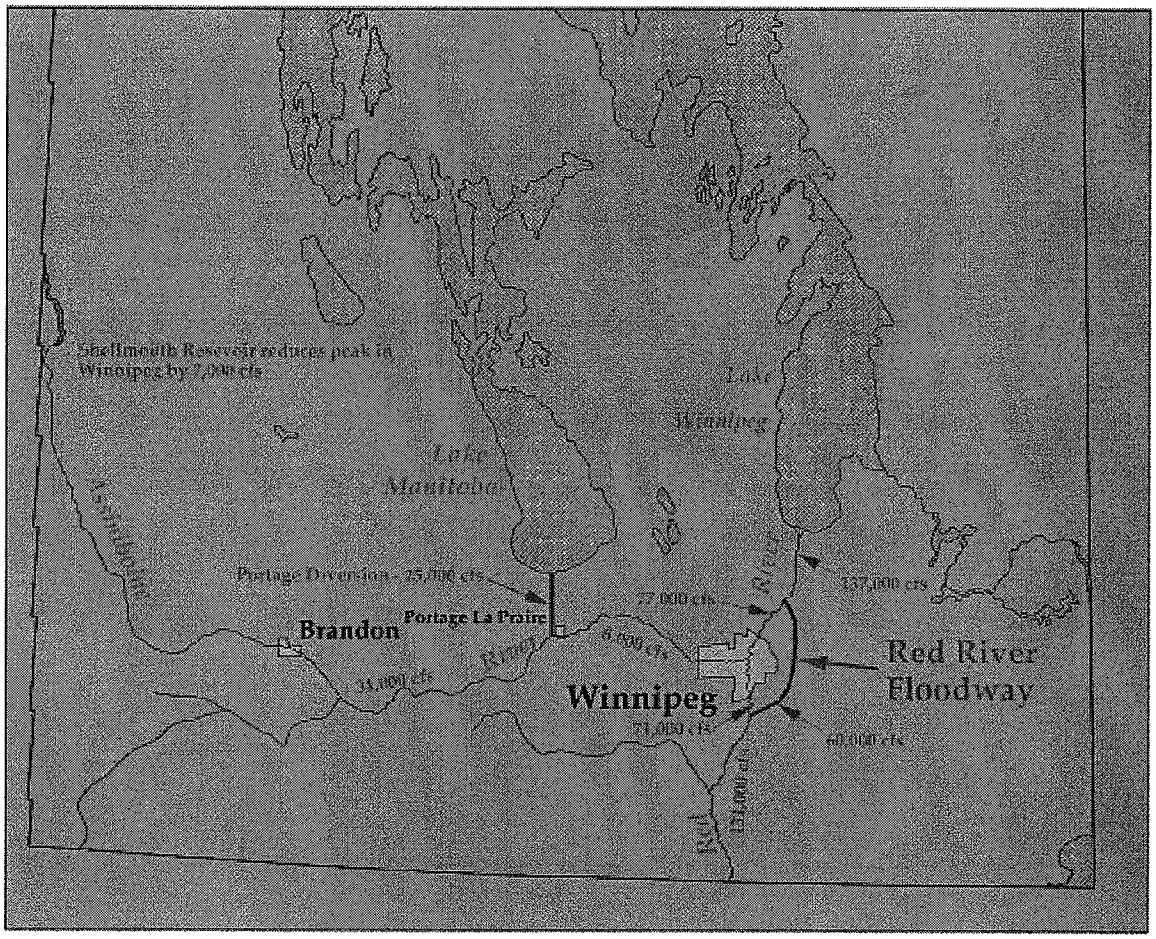

Figure 5 - Red River Floodway (Source: Red River Floodway Operation Review Committee, 1999)

The CCCD is primarily concerned with issues related to drainage, although other issues include the protection of groundwater resources and transportation networks. The CCCD wanted to utilize its involvement in the Floodway expansion EA to develop a plan to resolve summer drainage problems that result in extensive crop damage throughout the

area (Observation Notes, March 7, 2005). The District requires the ability to drain excess surface water into the Floodway. However, local agricultural producers have expressed frustration over the limitations of current surface water drainage infrastructure. The CCCD recommended that adequate drainage infrastructure be incorporated in the design of the Floodway (CEC, 2005).

3.3 Data Collection

The three methods of data collection used in this study were document reviews, qualitative interviews, and direct observation. The literature review, presented in chapter 2, evolved as the research unfolded and continued throughout the study. Document sources included academic journals, NGO records, media outlets (newspapers, radio, television, and internet), public registry files, and EA publications. These sources were important for collecting information about the design of the Red River Floodway, the EA process, issues of concern to community organizations and other EA participants, and background on the two case study organizations (CCCD and CFPN).

Face-to-face interviews provided an important source of information for these case-studies. Open-ended questions were utilized in order to give respondents an opportunity to present their opinions, ideas, and insights. As well, a key informant approach was used because both case study organizations were headed by a small group of leaders. Such an approach is helpful because key informants "not only provide the case study investigator with insights into a matter but also can suggest sources of corroboratory evidence--- and initiate the access to such sources" (Yin, 1994: 84).

Creswell (1994) outlined some of the advantages and limitations of using interviews for collecting data. Interviews are useful when it is not possible to directly observe informants. Furthermore, interviews are a valuable source of historical information and permit the researcher to exercise a degree of control over the line of questioning.

Creswell (1994) also recognized some of the limitations of interviewing. The first limitation relates to the fact that interviews provide indirect information filtered through the views of respondents. Second, interviews provide information in a designated setting, rather than in the natural field setting. Third, information collected using interviews may be biased because of the researcher's presence. Finally, some people may have difficulty articulating and expressing their ideas and views in oral format. These and other known advantages and limitations were considered throughout the design and implementation of the interviews. The main steps taken to optimize the benefits of conducting interviews were tape recording and transcribing to ensure accuracy, monitoring the interview participants for nonverbal cues, and using triangulation to verify interview data with other data types.

Nineteen interviews were conducted over two field periods: July 2004 to September 2004, and April 2005 to July 2005. Four of these interviews were conducted in the summer of 2004, for purposes of obtaining background information, learning about the issues of concern to the main community organizations, and gathering information for the purpose of group selection. Subsequently, two of these groups were selected for further

investigation. These interviews took place following the MFA's second round of public consultation, in which it conducted a series of open houses and workshops in various communities. In the following year, fifteen interviews were carried out, eight with members of the CFPN and seven with members of CCCD. By this time, the Environmental Impact Statement (EIS) had been filed and the Manitoba Clean Environment Commission (CEC) had conducted a series of public hearings. Interviews averaged ninety minutes and usually took place at the respondent's residence. A copy of the interview guide for the second round of interviews is attached as Appendix A.

The final source of information involved the collection of data through direct observation at public events. Public open-houses and hearings were attended during the EA process (Table 1). These forums provided background information relating to both the public involvement process and the issues and interests of the NGOs involved. Data collection at these events involved written note taking under the direction of a specifically designed observation checklist. See Appendix B for a copy of the observation guide.

3.4 Data Analysis

"Data analysis involves examining, categorizing, tabulating, or otherwise recombining the evidence collected for the purpose of addressing the initial propositions of the study" (Yin, 1994: 102). The data analysis was conducted simultaneously with the collection of data.

Table 1 - Open Houses and Public Hearings that were Attended

Event	Date	Place
TetrES/InterGroup Open House	10-Mar-04	Winnipeg South
MFA Open House	20-Apr-04	East Selkirk
MFA Open House	26-Apr-04	Morris
MFA Open House	29-Apr-04	St. Norbert
MFA Open House	3-May-04	Winnipeg North
TetrES/InterGroup Open House	2-Jun-04	Ste. Agathe
TetrES/InterGroup Open House	8-Jun-04	Dugald
TetrES/InterGroup Open House	16-Jun-04	Selkirk
TetrES/InterGroup Open House	23-Jun-04	Winnipeg South
CEC Public Hearings	Feb2005 – Mar 2005	Winnipeg/Oakbank

The first step of my analysis was to code and categorize the data. The purpose of coding is to "assign a descriptive designation to the various aspects of the data collected so that pieces of it can be easily retrieved" (Merriam, 1998: 164). Following Maxwell (1996), coding involved breaking data down into categories and rearranging them in order to facilitate comparison of the segments. Popular data coding techniques include using numbers, letters, words, or phrases. The data collected for this thesis were coded using categories derived from the literature review and the responses received from those interviewed. Examples of categories derived from the literature include *organizational*

memory and *impediments to social learning*. Examples of categories derived from grounded data include *groundwater issues* and *drainage issues*.

As the analysis progressed, data were further organized into similar themes or concepts (Table 2). The reduction of data into patterns and themes allowed for easier interpretation (Creswell, 1994). It was particularly useful for avoiding confusion when dealing with large quantities of data and for allowing easy access to the coded data. The patterns and themes that emerged in this research were grounded in both the theoretical concepts being applied and the data collected.

Table 2 - Reduction of Data into Patterns and Themes

	Themes and Patterns
1	Types of Learning
2	Links Individual/Social Learning
3	Coalition Background Info
4	CCCD Background Info
5	Public Involvement and EA Process
6	What was Learned
7	EA Background Information

The third analysis technique related to contextualizing the data. According to Maxwell (1996), contextualizing analysis is concerned with understanding the data in context. The contextualization analysis identified connections between categories and themes, and attempted to understand individuals and situations within the contextual framework of the interviews and the cases. For example, non-verbal cues, such as a person's tone of voice or mannerisms, were recorded and reflected upon during interviewing.

Memo writing was the fourth analytic technique used. Maxwell (1996: 11) defined memos as "any writings that a researcher does in relationship to the research other than actual fieldnotes, transcription, or coding". Memos function as a means to express ideas in relation to what is being researched. Memos were written whenever I had ideas concerning the topic, interview data, and methods. They proved particularly helpful in refining the analysis of observation notes.

Some spatial presentation methods included in this thesis are concept maps, and tables. These provided insight into how the various variables were connected and assisted in the understanding of process-related questions. Further, visual displays were useful for the purposes of reducing data and presenting data characteristic of the entire data set (Maxwell, 1996).

A qualitative computer software package called NVivo 2.0 was used throughout the data analysis phase. Interviews were recorded using an audio recording device. Following this, the interview was transcribed into a text document and transferred to a database in

NVivo. The use of this software package was instrumental for efficient coding, annotating, and comparing large quantities of qualitative data. The following figures are representations (actual computer screen shots) of aspects of the NVivo database. Figure 6 shows the project pad. This feature is used to access documents and open all items. Figure 7 illustrates the node explorer. This feature lists all of the ideas and categories (nodes) that were created during the coding process.

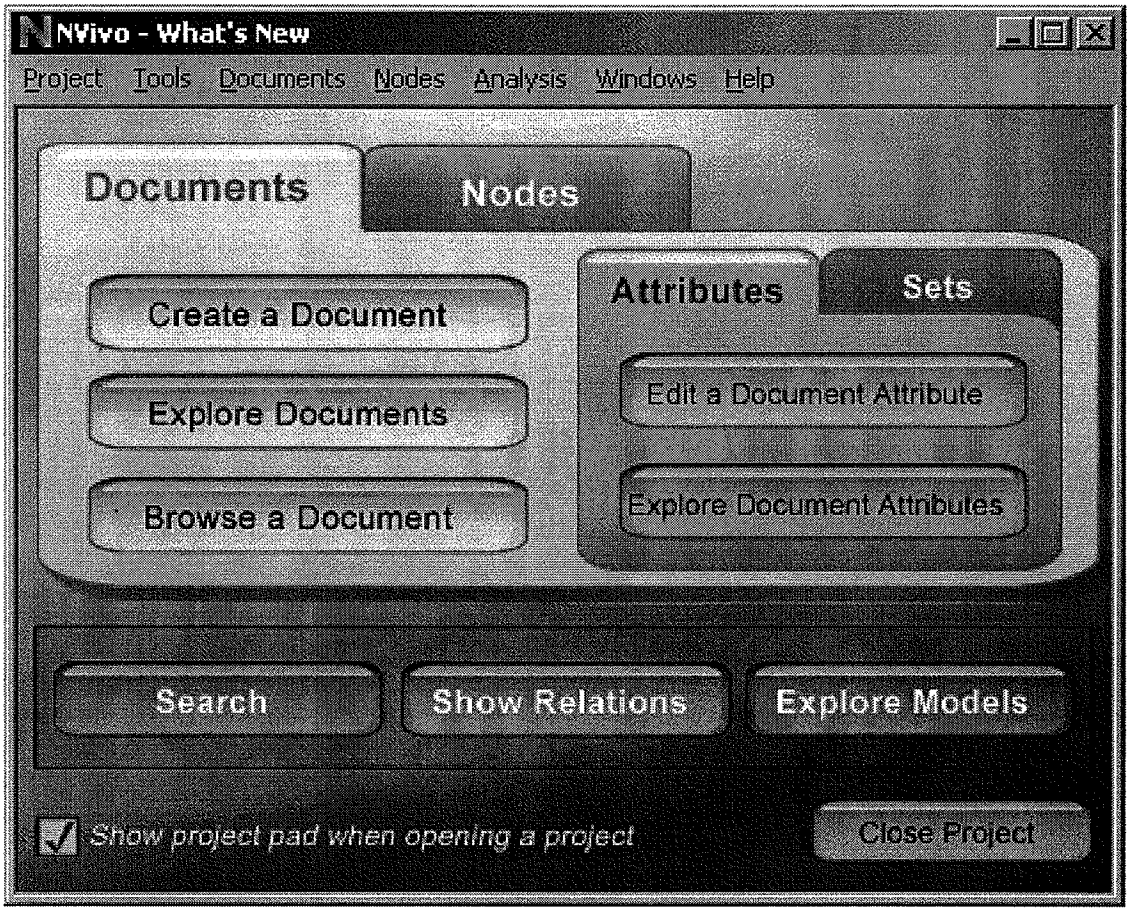

Figure 6 – NVivo Project Pad

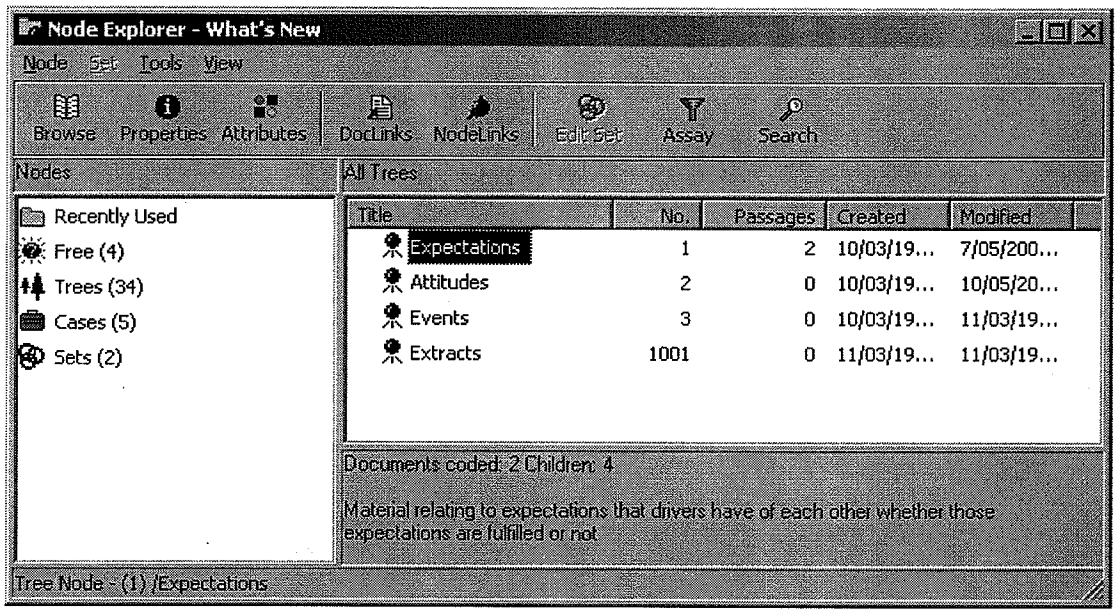

Figure 7 – NVivo Node Explorer

3.5 Validity

The threats to the validity of this research were addressed using the three main types of understanding (description, interpretation, and theory) outlined by Maxwell (1996). Audio recordings were used throughout the research to avoid the risk of inaccurately describing an interview. Validation methods were also utilized in designing and conducting interviews to limit the threat of false interpretation of the respondents. For example, open-ended questions allowed respondents to describe their views and ideas in detail. As well, I probed for clarification of any responses that were unclear. Finally, multiple explanations of phenomena were considered to avoid threats to the theoretical validity of the research. For example, a respondent's view of the public involvement process may not reveal anything about the quality of the public involvement opportunities that were offered.

In addition, Maxwell (1996) described two specific threats to the validity of qualitative conclusions. The first of these, *'researcher bias'*, refers to the selection of data that fit the researcher's existing theory or preconceptions and the selection of data that stand out to the researcher. *'Reactivity bias'*, the second threat, relates to the influences that the researcher has on the setting or individuals studied. The remainder of this section briefly identifies and explains the methods applied during the research for dealing with these validity threats.

The first method, *'triangulation'*, involved the collection of data from a diverse range of individuals and settings, using a variety of methods (Maxwell, 1996). The replication of findings using a diverse range of individuals and a variety of methods minimized the chances of researcher bias (Miller and Dingwall, 1997). The second method, *'member checks'*, refers to the "systematic solicitation of feedback about one's data and conclusions from interview respondents" (Maxwell, 1993: 94). This method was particularly important in preventing the possibility of misinterpreting what people said in the interview. *'Rich Description'* simply implies that the data collected throughout the research process should be described in detail and whenever possible be provided in complete entirety (Maxwell, 1996). The overall accuracy of the research findings are significantly improved using this validation method. As stated earlier, a combination of these methods and others were used to enhance the validity of the research being conducted.

3.6 Confidentiality and Ethics

All necessary approvals and consent were obtained from the University of Manitoba and the participants involved in the research. Written consent was requested from the participants prior to conducting interviews. Letters were issued prior to scheduled interviews explaining the reason why the research was being conducted and the purpose of participating in the interview. Participants were asked to sign two consent forms prior to proceeding with the interview. A copy of the consent form is attached as Appendix C. One of these copies was left with the respondent and the other was kept for my own records.

The data collected throughout this research were protected and treated as confidential. Interviews were transcribed and stored onto my computer hard drive and removable compact discs. Accessibility to these documents was prohibited to anyone other than myself and my thesis advisor. The data collected were coded to ensure that participant identities would remain confidential in any published material resulting from this research.

3.7 Summary

This thesis followed a qualitative comparative case study design, utilizing a literature and document review, face-to-face interviews and direct observation. Face-to-face interviewing proved to be particularly useful for describing individual and social learning outcomes. In contrast, direct observation was less effective because not every group member participated publicly. The data analysis involved coding, categorizing,

contextualizing, and memo writing. In total, nineteen in-depth interviews were conducted over two years. As well, an examination was completed of numerous journal articles, government documents, press releases, briefings, and reports.

Chapter 4

Public Involvement Experiences and Individual Learning Outcomes

4.1 Introduction

This chapter will identify what individuals learned as a result of their involvement in the Floodway expansion EA. The first section provides an overview of the Floodway expansion EA. The second section describes public involvement experiences in order to determine what the participants thought of the process and to identify possible learning opportunities. It is important to note that this section merely describes the perceptions of a small number of individuals, and in no way implies anything about the actual quality of the Floodway expansion EA process. The third section investigates individual learning outcomes that were experienced. Finally, the chapter will illustrate similarities and differences between members of the CFPN and the CCCD organizations.

4.1.1 The Floodway Expansion EA

The MFA, the project proponent, filed an Environment Act Proposal Form with Manitoba Conservation in July 2003. Following this, the Draft Guidelines for the preparation of the EIS were posted on the Manitoba Conservation website. There were two series of public consultation procedures conducted as part of the EA process. The TetrES and InterGroup firms, retained by the project proponent, conducted three rounds of consultation.

The public consultation activities of the first round occurred between January and March 2004. The second round of public consultation occurred in June 2004. Open houses and

workshops were held in various communities throughout the Red River basin during both of these rounds. Round three took place in the fall of 2004 after the EIS was filed. A separate public consultation process was undertaken by the MFA to address public issues and concerns not within the scope of the EA. These issues included flood compensation, recreational development opportunities and the summer operation of the Floodway. Open houses were conducted by the MFA at various communities in April 2004. In addition, the CEC held public hearings shortly after Manitoba reviewed and accepted the EIS. These were held over three weeks during February and March 2005.

The EIS for the proposed Floodway expansion was submitted by the MFA to the provincial and federal regulatory agencies in August 2004. The EIS reported that the proposed Floodway expansion would have insignificant adverse effects on the physical, aquatic, terrestrial and socio-economic environments. Despite this, several key ecological and social issues were raised by the public in the EA (CEC, 2005). Environmental issues of concern dealt with groundwater, erosion and sedimentation, drainage, ice jamming, aquatic habitat, surface water quality, climate, air quality and noise. Additional concerns raised by the public in the EA were of the terrestrial and socio-economic sort, including issues related to transportation disruption, flood protection, infrastructure improvements, land acquisition, mitigation/compensation and artificial flooding (Federal Screening Report, 2005).

Table 3 provides brief descriptions of several key governmental and non-governmental organizations (NGOs) which participated in the Floodway expansion EA. The listed

NGOs were highly active throughout the EA process, conducting research and attending public involvement events. Furthermore, all of these groups presented at the CEC hearings and provided feedback at various stages of the decision-making process (Observation Notes, March 8, 2005).

Having considered the EIS and the testimony presented at the hearings, the CEC recommended that licenses under *The Manitoba Environment Act* be issued to the MFA for the construction and maintenance of the expanded Floodway (CEC, 2005). The CEC also recommended that conditions be attached to the licenses in regard to operating rules, groundwater quality and quantity, the safety of the Floodway inlet control structure, and recreational uses of the Floodway right-of-way (CEC, 2005).

In accordance with the *Canadian Environmental Assessment Act,* Infrastructure Canada, Fisheries and Oceans Canada, and Transport Canada completed a federal screening report of the proposed Floodway expansion in May 2005. The report presented the results of the assessment and described requirements for monitoring, follow-up and reporting. Upon considering the potential impacts of the project, the responsible authorities concluded that it was not likely to result in any significant adverse environmental effects. This decision enabled the authorities to issue licenses, permits and other approvals for the project (Federal Screening Report, 2005).

Table 3 – Key Players in the Floodway Expansion EA (Source: Federal Screening Report, 2005)

Regulating Bodies	Description
Manitoba Clean Environment Commission (CEC)	Provincial body created by The *Manitoba Environment Act*. At the request of the Minister of Conservation, the CEC, amongst other related responsibilities, conducts public hearings concerning major projects that may affect the environment. The CEC writes a report about its findings and makes recommendations to the provincial government.
Manitoba Floodway Authority (MFA)	Authority established by the Government of Manitoba with the responsibility to carry out the planning, construction and maintenance of the Red River Floodway Expansion.
Project Administration Team (PAT)	Set up to oversee the joint federal and provincial review of the Floodway Expansion Project. The PAT is made up of senior representatives from the Canadian Environmental Assessment Agency and the Manitoba Department of Conservation that have an environmental assessment responsibility with respect to the Project.
Technical Advisory Committee (TAC)	Developed to review and provide advice on the Floodway Expansion Project to the Provincial Administration Team (PAT). The TAC is made up of representatives from federal and provincial departments that have an interest in the Project.
Intervener Organizations	**Description**
Coalition for Flood Protection North	Primarily concerned with groundwater, ice jamming and flood protection.
Cooks Creek Conservation District	Mainly concerned with drainage and water quality.
Manitoba Wildlands	Specifically concerned with the environment.
North Richot Action Committee	Primarily concerned with artificial flooding and compensation.
Richot Concerned Citizens Committee	Mainly concerned with flood protection and compensation.

On July 8th 2005, Manitoba Conservation issued an *Environment Act License* to the MFA for the construction and maintenance of an expanded Floodway. Construction began on the Floodway expansion in the summer of 2005, and has an expected completion date of spring 2010 (MFA, 2006).

4.2 Public Involvement Experiences

This section describes public involvement experiences in order to determine what the participants thought of the EA process and to identify possible learning opportunities. The section is structured around key indicators of meaningful public involvement derived from the literature (see section 2.3.2). Describing public involvement experiences is important because it highlights characteristics of the Floodway expansion EA that may or may not be conducive to meaningful public involvement. The satisfaction of individuals is revealed by describing their feelings and opinions towards the public involvement process. Table 4 summarizes some of the interview data regarding individual public involvement experiences in the Floodway expansion EA.

Table 4 – Public Involvement Experiences

Public Involvement Experiences: The Coalition for Flood Protection North of the Floodway (CFPN) and the Cooks Creek Conservation District (CCCD)

Do you feel that the public involvement process of the Red River Floodway EA has been fair?

	CFPN	CCCD
YES	2	5
NO	5	1
Undecided	1	1

Are you satisfied with the public involvement opportunities that were made available?

	CFPN	CCCD
YES	5	6
NO	1	0
Partially	2	1

Do you feel that your group was adequately funded?

	CFPN	CCCD
YES	1	1
NO	6	3
Undecided	1	3

Do you believe that the Floodway Expansion EA was transparent?

	CFPN	CCCD
YES	2	3
NO	6	1
Partially	0	3

Do you feel that your interests in the Floodway Expansion EA were adequately addressed?

	CFPN	CCCD
YES	1	3
NO	5	1
Partially	2	3

Do you feel as though the involvement of your group in the Floodway Expansion EA was meaningful?

	CFPN	CCCD
YES	8	7
NO	0	0
Partially	0	0

Participants took on duties specific to their group's mandate and objectives. For example, some members of the CCCD were instrumental in the formation of a subsidiary organization of agricultural producers. Furthermore, one of the members of the CFPN was highly active in publicizing group meetings and other events. Various members from both groups participated behind the scenes by providing input to their groups and responding to the issues raised by others. Each group had members who acted as facilitators at meetings. As well, there seemed to be recognized leaders in both groups. For both organizations, the bulk of activities that took place throughout the EA process were organized and orchestrated by a few key members. These members were the drivers and backbones for each of the respective organizations.

In general, the majority of respondents participated in the Floodway expansion EA by attending stakeholder meetings, hearings and open houses. Members from both groups participated at various levels of intensity. While some members attended all of the hearings and open houses, others attended one or two events. In addition, a small number of members from both groups made oral and written presentations and spoke to the EA consultants and MFA at hearings and open houses. Members from the CFPN met with the MFA on a few occasions throughout the EA process. One respondent remarked that, "the goals of these meetings were to express our interests and ensure that the design of the Floodway incorporates our concerns".

Numerous authors have highlighted the importance of meaningful public involvement in EA (Gamble, 1978; Roberts, 1995; Palerm, 2000). Only two of eight members who were

interviewed from the CFPN felt that the public involvement process was fair. However, the majority of respondents expressed both positive and negative feelings. Various members expressed the opinion that the MFA withheld important information throughout the EA process. As well, many members of the CFPN argued that the public involvement process was simply cosmetic. As one member put it, "the entire process was nothing more than window dressing". In addition, several members believed that the opportunities to participate in the process were constrained by the narrow scope of the EA. One of the respondents thought that the consulting firm did a good job at trying to include the public despite being constrained by the limited scope of the EA. The majority of respondents from the CFPN did not believe that the public involvement process was fair.

In sharp contrast to the CFPN, the majority of members interviewed from the CCCD felt that the public involvement process was fair. Three of the seven respondents believed that there was sufficient time and opportunity for the public to be involved throughout the EA process. One member held the opinion that it is difficult for the public to be involved in an effective manner because of the ongoing demands that people face in their everyday lives. Another member believed that the MFA did not advertise sufficiently prior to public meetings and open houses. Finally, one of the members from the CCCD also felt that the mandate given to the MFA was very limited in scope and did not really allow for adequate public input. Overall, the bulk of CCCD respondents believed that the public involvement process was fair.

Most of the members interviewed from both groups were pleased with the public involvement opportunities made available throughout the EA process. Once again, many members from both groups questioned whether they were being taken seriously and whether their concerns would be incorporated into the design of the expanded Floodway. A small number of members from the CFPN expressed dissatisfaction with the location of the hearings and open houses. As well, one respondent remarked, "I didn't like how the CEC Hearings schedule was changed from day to day". This member was frustrated with the constant changing of the scheduled presentations throughout the CEC hearing process.

A number of recommendations were made by members of the CFPN and CCCD. Various members from both groups felt that there should have been more intervener funding available and more opportunities for collaborative decision making. As well, a number of respondents from both groups perceived the public involvement process to be nothing more than a formality with which the MFA had to comply.

Members from the CFPN were of the opinion that the entire public involvement process was flawed as a result of a conflict of interest. They felt that the MFA was given too much control over the design of the public involvement component and the determination of the scope of the project. One respondent said, "I think that we have to take away the ability of the proponent to decide or influence what will be the scope of an EIS". Also, a few respondents were disappointed over the locations selected for the CEC hearings and the timing of the hearings. Two of the members from the CFPN expressed frustration

over having to drive long distances in order to attend the hearings. It was recommended by one member of the group that meetings be held in close proximity to the areas that stand to be affected the most from the proposed development. As well, another respondent recommended that the hearings take place in the evening.

The majority of CCCD members considered the public involvement process to be a positive experience. However, a few members believed that a higher degree of transparency was needed throughout the entire EA process. One respondent remarked that, "There could have been more funding available and also more flexibility in the scope of the project". Another respondent said, "They should be given a much wider scope in which to operate, especially for a project of this magnitude". In total, three of the participants that were interviewed from the CCCD recommended that more flexibility be given to the scope of a project and the mandate of the proponent.

The majority of members interviewed from the CFPN did not feel that their group received adequate funding to participate effectively in the Floodway expansion EA. One respondent commented that, "It would have been nice if we would have gotten more money and a little more time". Further, another respondent remarked, "I think that we could have had a significant impact on the outcome if we received our money and experts earlier". The data revealed that six out of eight members of the CFPN believed that their group was not adequately funded.

The members interviewed from the CCCD held differing views about whether they received adequate funding. Despite this, the data revealed that three out of seven respondents believed that their group was not adequately funded. Of the remaining respondents, one member felt that the funding was adequate and the other three members were undecided. One of the respondents commented that, "fifty percent of our funding was provided through intervener funding and fifty percent came from local Government". Further, as a well-established organization, CCCD relied heavily on its own resources. One respondent stated that, "It is a lot easier for a well-established organization to get involved in the public consultation process, as opposed to a group that is formed on the basis of reacting to a situation".

When these interviews took place, the CEC panel had not yet made its recommendations in regard to the proposed expanded Floodway. Many of the respondents from the CFPN were of the opinion that they had minor influence over the decision-making process. Nevertheless, the group was optimistic that their issues would be considered in the planning and design of an expanded floodway. One respondent remarked that, "our issues were heard, but I don't consider these issues addressed until there are some serious efforts made on behalf of our recommendations".

The responses from members of the CCCD were varied. A few members felt that their concerns were listened to, but not taken seriously. One of the respondents stated that, "We feel that we have brought out very pertinent points, but our influence was extremely limited". Various other respondents were unsure of the extent to which their group was

able to influence the decision-making process. One respondent remarked that, "I haven't seen their report yet (CEC Recommendations), so I don't know how influential we were". Another respondent said "I don't know at this point, but it was an uphill battle. It is imperative that the MFA implement proper drainage improvements while designing the Floodway expansion". As a whole, the bulk of the members interviewed from the CCCD felt that their issues and concerns were heard.

Numerous authors have highlighted the importance of transparency in public involvement practices (Webler et al., 1995; Palerm, 2000; Fitzpatrick and Sinclair, 2003). A lack of transparency throughout an EA process can negatively affect the quality of public involvement opportunities. The data revealed that six of eight participants interviewed from the CFPN concluded that the Floodway expansion EA lacked transparency. Various members believed that the MFA did not share and distribute information in an effective and fair manner. One respondent commented that, "When they began the process they hid the idea that, in fact, they would only be looking at the difference between the existing Floodway and the expanded Floodway". Another respondent stated that, "They chose to share what they wanted to share" and, "They didn't make all of their information public".

The members of the CCCD held differing views about whether they believed the EA process was transparent. Three of seven respondents were satisfied with the level of transparency, three respondents were partially satisfied, and one respondent was not satisfied. One respondent remarked that, "They were definitely transparent, but to say

that they went to the maximum degree to find out information, I would say no". Furthermore, one respondent stated that, "Information was shared, but as an interested party we had to go to great lengths to obtain some of the information that we sought". The majority of the respondents from the CCCD believed that the MFA did a satisfactory job of sharing and distributing information throughout the EA process. The data demonstrated that there was a relatively high degree of coordination and cooperation between the MFA and CCCD.

At the time of the interviews, a few respondents were reluctant to speculate whether their interests were adequately addressed because they were still awaiting the recommendations of the CEC. One respondent from the CFPN remarked that, "Until we get the final report we don't know what they are really going to do". Another respondent from the CCCD commented that, "Well again, I guess I would have to see the report to see if our interests have been addressed or not".

The data revealed that many of the CFPN members believed that at least one of their interests had been taken into consideration in the design of the proposed Floodway expansion. Some of the respondents were very adamant in believing that their group was responsible for bringing groundwater issues and concerns to the table in the EA. One respondent commented that, "It was because our group said early on that there is a real problem with groundwater. In order to solve the groundwater problem, they had to propose to widen the Floodway instead of deepening it". The data also revealed that five of the eight CFPN respondents concluded that their interests in the Floodway expansion

EA were not adequately addressed. One respondent thought that the entire public involvement process was "just a formality" and nothing more than a "big waste of time". Further, another respondent stated that, "Our issues were listened to but ignored". In general, the majority of CFPN respondents were skeptical as to whether their issues and concerns were taken seriously by the MFA.

Of the seven respondents interviewed from the CCCD, three respondents felt that their interests had been adequately addressed, three respondents were unsure whether their interests had been adequately addressed, and one respondent felt that their interests were not adequately addressed. One respondent felt that their issues were addressed, but also felt that the MFA was given too narrow of a scope and mandate to deal with them effectively. Another member said that, "Our issues were addressed at considerable effort and expense to the municipalities". Finally, one respondent commented that, "They did give us time and they did seem to show interest in our concerns. When I say that, I am talking about the people that ran the CEC hearings". On a whole, many of the respondents of the CCCD were confident that their issues and concerns would be adequately addressed in the Floodway expansion EA.

Various members from both groups expressed frustration and discouragement over certain aspects of the EA process. A respondent from the CFPN commented that, "I learned a whole lot of things about engineering, hydrology, groundwater, politics, and how it influences people and making decisions and so on. It has been a good process for us, but it was very frustrating at times". As well, a respondent from the CCCD remarked

that, "Our public involvement was meaningful in the sense that there were opportunities for citizens and organizations to participate". However, all members from both groups considered their involvement in the Floodway expansion EA to be meaningful.

4.3 Individual Learning Outcomes

As noted in section 2.3.2, EA provides an important opportunity for individuals and community groups to engage in learning. This section explores learning outcomes experienced by individuals. The research objectives and literature review were integral to the formation of the following learning outcome categories:

- environmental issues and concerns (including: pollution, flooding, groundwater and drainage);
- technical features, procedural aspects and legal requirements of EA; and,
- interactions among participating individuals and groups (which encompasses learning about the issues and concerns of other individuals or groups involved in the Floodway expansion EA process).

4.3.1 Environmental Issues and Concerns

Members from both the CFPN and the CCCD gained knowledge about various environmental issues as a result of their involvement in the Floodway expansion EA. Respondents from both groups experienced learning in one or more of the following areas: ecological/environmental aspects; flooding issues; groundwater aspects; and/or, drainage concerns. The learning that occurred was often more pronounced if the issues of concern were important to the mandate and goals of the organization involved.

All of the members interviewed from the CFPN were of the opinion that they had gained an increased understanding of ecological/environmental aspects as a result of their participation in the Floodway expansion EA. The majority of respondents expressed deep concern over the possibility for groundwater contamination. Issues pertaining to groundwater will be explored in greater detail later on. Various members from the CFPN criticized the MFA for failing to adequately address environmental/ecological issues. In response to the question regarding ecological/environmental aspects, the following comments were made:

> I didn't really feel that the engineers and the MFA, in general, were concerned about the environment. I think that they were more concerned about building the damn ditch as fast as they could and as deep as they could and as wide as they could.
>
> They were going to go deeper and now they are going to dig it wider. I didn't realize how deep it was and how dangerous it could be to the groundwater.
>
> I seemed to learn quite a bit about how the aquifer is polluted, how it spreads out and how the water in the floodway is polluted.
>
> It increased my awareness of the sacrifice that this region will have to make to expand the Floodway. I am more aware of the possibility of groundwater contamination. It is not that it might happen but when it will happen.

The members of the CCCD also felt that they had gained an increased understanding of environmental issues. Overall, many CCCD members perceived their involvement as necessary for achieving sustainable agricultural practices and addressing drainage problems that may occur as a result of an expanded Floodway. In response to the question regarding ecological/environmental aspects, it was remarked that:

> There were a lot of fields explored that I never had a lot of involvement with before. So, yes it was a real eye opener.
>
> I learned that for every cause there is a reaction. I am more aware of the possible environmental impacts that may result.
>
> Groundwater is probably the biggest issue that I became more familiar of. With livestock here it is a big one in our minds all the time. We want to be sustainable and environmentally friendly and we always try to be proactive. Environmental issues are always big items when you are talking about farming or flood protection.

The majority of members (seven out of eight) from the CFPN were also of the opinion that they had gained an increased understanding of flooding issues. The data indicated that many respondents were concerned about issues related to flood-protection-equity in the Red River basin. In addition, a few respondents expressed a heightened awareness of hydrological processes. Furthermore, a few respondents expressed frustration over the decision-making process for the operation of the Floodway. In response to the question regarding flooding issues, the following comments were made:

> It increased my awareness of the sacrifice that this region will have to make to expand the Floodway.
>
> I certainly became more aware about the mechanics of the rivers. Although, I told you that I took courses in hydrology thirty years ago.
>
> The operating rules are supposed to be set down so that everybody understands them. But, they are not etched in stone. We don't know when they are going to do that. So, that's a problem, and, it would be nice to know when that deluge of water is going to come.

Many of the CCCD members (five out of seven) felt that they had gained an increased understanding of flooding issues. For the most part, respondents indicated that they were more aware of potential flood impacts. As well, various respondents demonstrated a better understanding of the geography of the Red River basin and the location of flood

prone areas within. In reply to the question concerning flooding issues, it was remarked that:

> I learned about the impact that the functionality of the Floodway has on the upstream people.
>
> I probably learned the most about how the inlet structure works and the impact that it has on the residents south of the Floodway.
>
> I guess I learned about the different areas that are prone to flooding.
>
> We learned more about certain areas that experience flooding.

The data revealed that all of the members of both groups experienced learning related to groundwater issues. However, this issue was addressed in greater depth by members of the CFPN. Respondents emphasized the importance of protecting local aquifers and expressed serious concern over the potential for groundwater contamination as result of an expanded Floodway. In response to the question regarding groundwater, it was commented that:

> We know the direction that groundwater travels. And, we know that there are two aquifers in the region.
>
> I didn't know that there was a threat of contaminated water draining into the aquifer.
>
> I learned how vulnerable the groundwater is to pollution.
>
> I learned a lot about groundwater issues. In the end, I learned that once you pollute your aquifer you can't get it back.

On a whole, members of the CCCD also seemed to be quite knowledgeable about groundwater issues despite the fact that these issues were not a central focus of its mandate. Comments made in reference to the groundwater question included:

> Despite having an awareness of groundwater issues, I certainly learned a great deal.
>
> I learned that they can't really afford to go any deeper. They are digging the Floodway wider in order to protect the groundwater.
>
> I learned that the original floodway cut through the natural aquifers in the area and that the expanded Floodway is likely going to exacerbate these problems.

The bulk of CFPN members (five out of eight) described learning experiences related to drainage issues. Comments were made with reference to perceived drainage problems in the Red River basin. As well, respondents expressed worry over the efficiency of spring water runoff from agricultural fields. In response to the question concerning drainage issues, it was remarked that:

> I learned about agricultural drainage issues. As far as I am concerned, each agricultural drain in Manitoba should be regulated, especially in the lower Red River valley.
>
> Apparently there have been lots of outlets put in to drain agricultural fields. All of that adds to the flow of the river. Fifty years ago none of those drains were there.
>
> Farmers have landscaped their land with these big graders, which results in water being drained off more efficiently. They are draining everything before the ice has left the river.

The majority of CCCD members (five out of seven) also reported an increased understanding of drainage issues. Various respondents emphasized the necessity for improved drainage access to the Floodway during summer flood events. Further, a few respondents expressed an increased awareness of proposed drainage design features and hydrological processes. In response to the question regarding drainage issues, the following comments were made:

> They are going to make improvements to the drop structures and the drainage infrastructure of the Floodway. I learned how fast surface water can move.
>
> The biggest concern to the farmers in this area is that they have been experiencing unusually heavy rainfall, and therefore, summer drainage is a more important issue in the CCCD.
>
> You just can't let it go loose, there has to be some sort of control or restricted flow to ensure that you don't cause erosion.

4.3.2 Technical Features, Procedural Aspects and Legal Requirements of EA

Through their involvement in the Floodway expansion EA, various members from the CFPN and the CCCD gained an increased understanding of technical features, procedural aspects and legal requirements.

Almost all of the CFPN members (seven out of eight) reported an increased understanding of technical features and design details of the proposed expansion to the Red River Floodway. The data revealed that many of the respondents were quite knowledgeable about design revisions that were made to prevent the possibility of groundwater contamination. Also, many respondents demonstrated an ability to describe details related to the scope of the project and the operating rules of the Floodway inlet structure. In answering the question regarding technical aspects, the following observations were made:

> I learned the reasons why the MFA decided to widen the Floodway channel as opposed to digging it deeper.
>
> Well, I know that they are not going any deeper and that they are going to implement more measures to protect the groundwater.

> I also became aware of technical aspects related to proposed construction of the inlet and outlet structures and the transportation networks.
>
> I learned about the operation of the Floodway gates.

All of the CCCD members were able to bring to mind learning related to technical features. The data revealed that several respondents reported an increased understanding of design details. As well, two respondents reported difficulties in understanding some of the technical aspects of the project. In response to the question regarding technical aspects, the following comments were made:

> I learned a lot about the complexities involved in expanding the Floodway. It is not as simple as just digging the ditch bigger, there is a lot more involved in it.
>
> I learned about aspects of the design of the proposed expanded Floodway. As well, I learned about the rationale behind increasing the width of the floodway as opposed to the depth.
>
> I mean, I understand aspects of the Floodway design. But, I wasn't sure what the project consisted of. Were they going to improve the existing Floodway or expand the Floodway?
>
> A lot of that stuff is way over my head. The committees that work on it and the CCCD experts have a better understanding of that.

The majority of CFPN members (seven out of eight) reported an increased understanding of EA legal requirements. Many of the respondents expressed a certain degree of distrust and frustration regarding EA governing bodies and legislation. In response to the questions regarding legal requirements, it was remarked that:

> Well, we have become more aware of EA governing bodies and requirements from our involvement.
>
> I am more familiar with differences between the federal and provincial laws.

> Some of the problems with the Red River Floodway EA relate back to the actual legislative requirements and governing bodies. The CEC can not order anybody to do anything, they can only make recommendations.
>
> The other part of that I was really hopeful for, as were other members of the coalition, was that the Federal Government would step in. Because, they were funding the project to the tune of 60% or 400 million dollars, that they would of, perhaps, been a bit more discerning when it came to what was really involved in this proposal. I don't think they have fully.

As a result of their involvement, all of the CCCD members believed that they were more familiar with EA legal requirements and governing bodies. Various respondents reported becoming more familiar with project licensing requirements. As well, a few respondents expressed a heightened understanding of the CEC process. In response to the questions regarding legal requirements, it was commented that:

> I learned more about how an environmental assessment is structured.
>
> I learned more about the nature of the CEC panel and hearing process.
>
> I am more aware now of what is required in order to obtain a license for a project of this magnitude and type.
>
> I am more familiar with the process and licensing requirements.

All of the members interviewed from the CFPN stated that they had gained an increased understanding of political aspects. Several of the respondents considered the entire decision-making process to be politically motivated. The following comments were made in response to the question regarding political aspects:

> I learned that politicians are a driving force in the decision to go ahead with the Floodway expansion.
>
> The process seems to be politically motivated. Political leaders are a driving force in these types of projects.
>
> There is political influence and persuasion in the decision-making process.

The majority of CCCD members (five out of seven) reported an increased understanding of political aspects. Several of CCCD respondents also alleged that the decision-making process was politically influenced. In response to the question regarding political aspects it was remarked that:

> I am now aware of the political influence and political pressure involved in getting something like this accomplished.
>
> That was probably one of the most disturbing parts, all of the political aspects of it, starting from municipal right to federal. They are supposed to be working for all the people, not just the majority of the people all the time. That is where we really felt the wrath of being a minority out there.
>
> There was a lot of politics in the process. Politicians needed to take stock of the interests that were present in their municipalities.

4.3.3 Interactions among Participating Individuals and Groups

As a result of their involvement in the Floodway expansion EA, members from the CFPN and the CCCD developed an understanding of the issues and perspectives of other individuals and groups participating in the process. The data revealed that many respondents had acquired at least some knowledge about the proponent (MFA) and other community groups participating in the public involvement process.

All of the CFPN members reported an increased understanding about the MFA. Many of the respondents deemed that the MFA was not willing to address their concerns meaningfully. In response to the question regarding learning related to the MFA, it was commented that:

> They were given the mandate to make the capacity of the Floodway double of what it is, and the hell with the rest.

> Well, I don't think that they took any of us seriously.
>
> They were very arrogant and they thought that they could steamroll over this small political constituency.
>
> I learned that the MFA is singularly focused on one thing, and that's building the Floodway, that's it. All other issues are of no consequence to them.

The majority of CCCD members (five out of seven) also indicated that they had gained knowledge of the MFA through their involvement. Respondents remarked that they were more familiar with the responsibilities and mandate of the MFA. In response to the question regarding learning related to the MFA, it was remarked that:

> We learned what their responsibilities are; what their tasks at hand are; what their operating guidelines are; what triggers the opening of the gates; and, the functionality and criteria behind it all.
>
> I learned that they have a very narrow mandate and agenda that is followed. They seemed to listen to our concerns, but I am not sure if any actions will be taken in this manner.
>
> I learned that they want to get going on their job. Again, they had an agenda and a mandate to expand the Floodway.

All of the CFPN members reported an increased understanding of other community groups participating in the Floodway expansion EA process. Respondents demonstrated a familiarity with the interests and concerns of other individuals and communities. The following comments were made in response to the question dealing with learning related to other community groups:

> Until you get involved in the process you don't know what is going on out of your area. Everybody tends to look after themselves. In the end, I became more knowledgeable about other groups' issues.

> South of the Floodway there were several groups, all of which essentially had the same concerns.
>
> In general, I am more knowledgeable of various groups concerns as a result of my involvement in the Red River Floodway environmental assessment process.

As a result of their involvement, all of the CCCD members believed that they were more familiar with the issues and concerns of other community groups participating in the process. Respondents were knowledgeable of the locations of other affected communities. As well, respondents were familiar with the courses of action being explored by other community groups in response to Floodway expansion EA. With reference to the question regarding other community groups, it was commented that:

> One of the biggest learning experiences was learning the concerns of the people south of the Floodway and north of the Floodway. I was a little bit embarrassed that we were recommending the expansion of the Floodway, while there were some legitimate issues that needed to be addressed prior to construction.
>
> I learned that every community has different concerns. They are not all negatives. There are benefits and there are drawbacks..
>
> The specific issues seemed to differ from one region to the next.
>
> There were a lot of different community groups involved. I was amazed at all the concerns from all the different areas.

4.4 Comparing Public Involvement Experiences and Learning Outcomes

Many similarities and differences existed between the experiences of the CFPN members and the CCCD members in the Floodway expansion EA. This section compares the public involvement experiences and learning outcomes of CFPN and the CCCD members. While several differences existed, it is difficult to conclude whether these

differences were a result of group structure or some other underlying factors. However, it is reasonable to assume that fundamental structural differences between the CFPN and the CCCD were influential in determining individual public involvement experiences and learning outcomes.

4.4.1 Public Involvement Experiences

Members of both groups participated by attending stakeholder meetings, hearings and open houses. In the main, CFPN members believed that the public involvement process was not fair. In contrast, the majority of members interviewed from the CCCD felt that the public involvement process was fair. All of the members of both groups were satisfied with the public involvement opportunities provided throughout the EA process. However, members from both groups questioned whether they were being taken seriously and whether their concerns would be incorporated into the framework of an expanded Floodway.

On the whole, the majority of CFPN members believed that their group did not receive adequate funding. Further, the majority of CFPN members concluded that the EA process lacked transparency. By comparison, CCCD members were somewhat pleased with the amount of participant funding received. In addition, members of the CCCD were divided in their views about whether they believed the EA process was transparent. The majority of CFPN members thought that their issues and concerns would not be addressed adequately. In contrast, most of the CCCD members were confident that their issues and concerns would be sufficiently considered.

In general, many members of both groups expressed frustration and discouragement over certain aspects of the Floodway expansion EA process. As well, various respondents were unsure of the extent to which they were able to influence decisions. However, all members from both groups considered their involvement in the Floodway EA to be meaningful.

4.4.2 Learning Outcomes

Many similarities and differences also exist between the learning outcomes experienced by CFPN members and the CCCD members in the Floodway expansion EA. Members of the CFPN and CCCD gained knowledge about various environmental issues as a result of their involvement. Numerous members of the CFPN were deeply concerned about the possibility of groundwater contamination. As a result, CFPN members were adamant in stressing the importance of protecting local aquifers during the construction and operation of an expanded Floodway. As well, the majority of CFPN members reported an increased knowledge of flooding and drainage issues.

CCCD members also demonstrated an increased understanding of groundwater and flooding issues. However, these issues were not central to their mandate and the learning in these categories reflected that. The majority of CCCD members sought to address summer drainage problems that affect agricultural production throughout the district. Various respondents reported an increased awareness of proposed drainage design features and hydrological processes. On a whole, CCCD members emphasized the importance of improving drainage access to the Floodway during summer flood events.

The majority of CFPN and the CCCD members gained an increased understanding of technical features, procedural aspects and legal requirements from their involvement in the Floodway expansion EA. The data revealed that many CFPN and CCCD respondents were quite knowledgeable about design details. As well, nearly all of the members from both groups reported an increased understanding of legal requirements and governing bodies. Finally, the majority of members from groups felt that they were more aware of political aspects of the Floodway expansion EA. Several respondents from both groups viewed the decision-making process as politically influenced.

In general, both the CFPN and the CCCD members demonstrated an increased understanding of issues and perspectives of other individuals and groups participating in the Floodway expansion EA. All of the CFPN respondents and the majority of CCCD respondents reported an increased understanding of the MFA. Members from both groups were more aware of the MFA's mandate to expand the Floodway. As well, all of the CFPN and CCCD members believed that they were more knowledgeable about the issues and concerns of other community groups participating in the process.

4.5 Summary

The Floodway expansion EA provided an excellent opportunity to investigate the participation of the CFPN and the CCCD. Learning opportunities were available for these organizations throughout the public involvement component of the EA. This chapter examined the public involvement experiences and learning outcomes of

individuals involved in the Floodway expansion EA. All of the members of both groups considered their involvement in the Floodway expansion to be meaningful. However, many respondents questioned whether they were taken seriously and whether their concerns would be incorporated into the design of an expanded Floodway. Several learning opportunities existed in the Floodway expansion EA. The learning that took place reflected the goals and objectives of the participating organizations. Whether the learning that occurred was transmitted to the organizational level is explored in the next chapter.

Chapter 5

Individual and Social Learning Linkages

5.1 An Investigation of the Linkages Between Individual and Group Learning

In order to achieve desirable social learning outcomes, knowledge must be effectively communicated from the level of the individual to the level of the group. An organization that is capable of acquiring and incorporating the accurate knowledge of each individual member effectively will be better informed, thus leading to participation in EA that is both meaningful and of high value to decision makers. The second section of this chapter discusses the linkages between individual learning and social learning and describes barriers that prevent or discourage social learning. The third section illustrates single-loop and double-loop social learning outcomes experienced by the CFPN and the CCCD because of their involvement in the Floodway expansion EA.

5.2 Organizational Memory

As noted in Chapter 2, organizational memory is formed when individual learning is embedded in the private and public memories of the organization. Organizational learning may involve organizational action (actualized by individual agents of the organization) founded on organizational memory. Action can result in new individual knowledge, which can be embedded in organizational memory, thus renewing the learning cycle (Figure 3).

Both the CFPN and the CCCD utilized various forms of organizational memory. Dialogue that took place among group members in both organizations contributed to the production of private memory in the form of mental images and/or maps. In terms of public memory, both organizations have preserved written records of several group meetings. In addition, their goals and objectives have been outlined and stored in digital and hardcopy formats that are easily accessible to all group members (e.g., CFPN's EIS comments). As a well-established organization, the CCCD also maintains formal district management plans that outline its mandate. In the end, these organizational maps and images governed the modes of inquiry and actions explored by both the CFPN and the CCCD in the Floodway expansion EA.

The following section explores several impediments (listed in section 2.3) to the formation of organizational memory. The development of organizational memory in both groups was not significantly affected by these impediments.

5.2.1 Transparency within the Structure of the Organization

Transparency factors were not significant in preventing the formation of organizational memory in the CFPN and the CCCD. Both groups were relatively transparent in their decision-making and idea-sharing processes. In regard to the question dealing with decision making and idea sharing, a CFPN respondent commented that, "We have a strong cooperative kind of approach. It is usually a formal kind of process - we discuss it, there is a motion, and a resolution is passed". As well, a respondent from the CCCD remarked that, "Generally, ideas come from the public to the board members via the sub-

districts. The Board then assesses the sub-district's programs, prioritizes them, and then votes on them. Majority vote on sub-district programs is how the Board determines the CCCD's programs".

5.2.2 Leadership

Both the CFPN and the CCCD possess clearly recognized leadership entities within their groups. However, no evidence suggests that the strong leadership was an impediment to organizational memory. On the contrary, the leadership of both groups was extremely effective in advancing communication opportunities through their planning of group activities and learning events. As well, the leadership of both the CFPN and the CCCD was instrumental in encouraging the sharing of ideas and dissemination of knowledge among group members.

5.2.3 Organizational Structure

In comparing the two groups, it was obvious that the CFPN lacked the rigidity in organizational structure that was present in CCCD. As a community group formed relatively recently, the CFPN was loosely organized and informal in its decision-making processes. However, in this case, the data did not reveal that these characteristics were factors inhibiting the generation of organizational memory.

5.2.4 Opportunities for Dialogue and Communication

As highlighted earlier, both the CFPN and CCCD provided sufficient opportunities for open dialogue among all members throughout their involvement in the Floodway

expansion EA. A respondent from the CFPN commented that, "We have an executive, and when it is appropriate to make a decision, or to look at an issue, we get together". In addition, a respondent from the CCCD remarked that, "I do not really have a formal role in the organization. I provide input and support the issues put forward by our group". Both groups engaged in discussions regularly at group meetings and by telephone and the internet.

A deficient communication network is also a potential impediment to achieving organizational memory. Both the CFPN and the CCCD were successful in communicating among group members. The data did not reveal any impediments related to the communication networks of either group.

5.2.5 Funding

An organization requires adequate funding before it can actively pursue research and participate in public events. In turn, the learning that members experience through their participation in various public involvement activities contributes to the formation of organizational memory. Social learning is hindered when a group's actions are restricted by insufficient financial resources. The CFPN's financial support was not as strong as that of the CCCD, and many of their members expressed frustration over funding inadequacies. One member remarked that, "There should have been a little bit more funding available for hiring consultants". Another respondent stated that, "Make more funding available for hiring consultants'. The data revealed that funding inadequacies

may have prevented the CFPN from engaging in public involvement opportunities, which in turn, may have impeded its formation of organizational memory.

5.2.6 Time Constraints

Time constraints are potential impediments to the formation of organizational memory. Groups need enough time to grasp important concepts to which they are exposed throughout their participation. The data revealed that the MFA provided sufficient time for public involvement in the Floodway expansion EA. However, one member of the CFPN did criticize the timing of the CEC hearings. In regard to the question concerning improving public involvement, it was commented that, "If CEC hearings were held in the evenings there would have been more people at them because people would have went after they finished work for the day". Nonetheless, there was no evidence to suggest that this was a major impediment to either group's ability to develop organizational memory.

5.2.7 Documentation

Documentation factors were not significant in preventing organizational memory in the CFPN and the CCCD. These two groups were effective at documenting activities, ideas and decisions. As well, as stated earlier, both groups were relatively transparent in their decision-making processes and distribution of information.

5.2.8 Unresolved Conflict

Unresolved conflict and disagreement within a group may impede ability to develop organizational memory. Only one member from the CFPN expressed frustration

concerning courses of action being pursued by the group in the Floodway expansion EA. In response to the question regarding individual differences, it was commented that, "Some of us do have different concerns within our group". Other than this particular situation, both the CFPN and the CCCD demonstrated agreement and cooperation among group members. There is no significant evidence to suggest that unresolved conflict and disagreement were limiting factors in either group's ability to develop organizational memory.

5.2.9 Learning Difficulties

Individual learning difficulties can be detrimental to the development of organizational memory. Members from both groups participated in varying degrees throughout the Floodway expansion EA. The data revealed that certain members experienced difficulties grasping technical information presented by the MFA in written documents and at public involvement events. In regard to the question dealing with public involvement satisfaction, a CFPN respondent commented that, "I felt that the public was not educated enough to participate in a meaningful manner". Another CFPN respondent stated that, "The layperson really doesn't have the knowledge to get involved in the process". As well, a CCCD respondent remarked that, "We had a huge amount of material, but oddly enough reasonably intelligent people didn't really understand what was out there". Both the CFPN and the CCCD experienced minor learning difficulties that may have inhibited their development of organizational memory.

5.3 Identifying the Gap Between Individual and Social Learning

A gap between individual and social learning may be present if individual knowledge is not embedded in the organizational memory of the group. There were no major barriers to the development of organizational memory, therefore there were no major gaps between individual and social learning. For the most part, the key individual outcomes were congruent with the major social learning outcomes discussed in the next section. However, minor gaps between individual and social learning did exist in both the CFPN and the CCCD. These learning differences resulted from specific self-interests and concerns that were held by individuals. The knowledge of these individuals did not become embedded into organizational memory because it was not relevant to the group's overall objectives and goals. For example, a CCCD member commented that, "The organization has a direction that they have to cover off on. I am sure that everyone in the organization has learned more throughout the process, but then, the organization has a focus. There are differences between what the organization learns and what people learn out of their own interest".

Various members of both the CFPN and the CCCD demonstrated knowledge that was not present in the organizational memory of their respective groups. For instance, one member of the CFPN was more knowledgeable of problems related to the erosion of his property and the surrounding area. This member remarked that, "I have lost twenty feet of river bank, and I am on the inside of the meander. They are on the outside of the turn and they are not getting any erosion because they are on a rock bottom. We are on a

muddy river bank and therefore we are the ones that are getting the erosion". Further, another member of the CFPN stated that, "Some of the people are saying things about what the ice does and how it breaks up. I don't agree with what they are saying because they haven't had a lot to do with this issue. For instance, you see these willows here, if you take those out the river bank will erode". In the end, the knowledge of these individuals remained entrenched in their own private memories. However, this gap between individual and social learning did not significantly impede either group's ability to participate effectively in the Floodway expansion EA.

5.4 Describing Social Learning Outcomes

Neither the CFPN nor the CCCD experienced significant impediments to the development of organizational memory, and thus it is no surprise that both groups experienced social learning throughout their involvement in the Floodway expansion EA. This is important because, as noted earlier, meaningful public involvement is ultimately dependent upon the learning outcomes experienced by participating groups. The ensuing discussion cites examples of social learning experienced by the CFPN and the CCCD, using the two main types of learning described by the theory of action: single- and double-loop learning. What distinguishes the social learning discussed below from the individual learning experiences discussed in chapter 4 is the presence of consensus views among group members that often result in collective action. However, it should be noted that, thoughts or views may become embedded in organizational memory without actually resulting in obvious group actions.

5.4.1 Single-Loop Learning

The CFPN and the CCCD demonstrated single-loop learning outcomes on several occasions throughout their involvement in the Floodway expansion EA. Single-loop learning takes place when there is a match or mismatch between intention and outcome. This type of learning often results in behavioral changes or changes in strategies and techniques. Under these circumstances, an organization will continue to operate under the context of its original policies and norms.

For the most part, the majority of social learning outcomes experienced by both groups in the Floodway expansion EA can be classified as the single-loop type. Single-loop learning results in group changes and should not be confused with learning that takes place at the level of an individual. The focus of this section will be to portray single-loop learning outcomes that resulted in obvious group consensus or action (changes in a group's behavior, strategies or techniques). In this case, the changes experienced by the CFPN and CCCD resulted in better understanding of environmental factors. Further, many of these changes contributed to their overall comprehension of the issues and concerns of other stakeholders. Finally, several changes led to the development of techniques and strategies that enabled both groups to participate more successfully in the Floodway expansion EA. These types of adjustments are instrumental in contributing to the overall effectiveness of a group's participation in EA, which in turn, may contribute to sustainable resource management practices.

Both the CFPN and the CCCD experienced single-loop learning that contributed to their understanding of environmental factors. Overall, the CFPN seemed to display a heightened level of appreciation for certain environmental factors as a result of its involvement in the Floodway expansion EA. In response to the questions regarding people's perceptions of the natural environment, the consensus was:

> I think the environment is very important. Not until you see these projects do you realize what the impacts are on the environment.
>
> Not just more aware, I think I am acutely aware of how we're destroying, and how we don't care.
>
> I have become much more aware of these issues. Frankly, I am fearful for the future of this region. They are sacrificing this region to save the lowest hole in the valley.

The CCCD also demonstrated single-loop learning that contributed to its valuing of certain environmental aspects. Further, the CCCD highlighted the importance of achieving sustainable agricultural practices. The consensus of the group is reflected in the following comments made in response to the questions regarding perceptions of the natural environment:

> Overall, I would say that I am now more aware of the natural environment, particularly around groundwater.
>
> We would like to achieve agricultural practices that are sustainable in the years to come.
>
> I value groundwater more, and, see the potential for groundwater contamination as a major problem that will need to be addressed in the plans for the Floodway expansion.

An understanding of other groups' concerns and issues may contribute to a cooperative and coordinated public involvement effort. Both the CFPN and the CCCD experienced

single-loop learning that changed their views of other stakeholders participating in the Floodway expansion EA. One CFPN respondent remarked that, "At first I questioned why some of these people are here. After hearing some of their presentations I came to understand why they were interested in this environmental assessment". Another respondent stated, "I guess I have more respect for them, now that I have seen what they are up against when it comes down to trying to change the direction of these juggernauts".

Several CCCD members also displayed altered perceptions of other groups involved in the Floodway expansion EA. One respondent commented that, "I became more knowledgeable about the other community group's concerns". Further, it was remarked that, "Some of the groups were quite extreme. Others were very organized and had legitimate concerns and intentions".

Both the CFPN and the CCCD engaged in single-loop learning during their development of public involvement strategies and techniques. The acquiring of new skills among group members contributed to the effectiveness of the CFPN in the Floodway expansion EA. This was evident in the presentations observed at the CEC hearings (Observation Notes, February 24, 2005). Numerous respondents reported having developed strengthened abilities in the following areas: public presenting, operating new technologies, conversing with government officials, dealing with media, and, working with other organizations. In response to the question regarding the development of new skills among group members, it was remarked that:

> We developed skills in public speaking and learned ways to express our intelligence. Several people learned to handle themselves better in a public forum.
>
> People developed technical skills related to the equipment used for presentations.
>
> I think we became skillful at dealing with the media.
>
> We also learned how to work effectively with other organizations.

The development of new skills and strategies also contributed to the effectiveness of the CCCD in the Floodway expansion EA. New skills were developed in many of the same areas outlined previously for the CFPN. In response to the question concerning the development of new skills, it was commented that:

> People developed skills in presenting and public speaking. We learned to reflect on some of our own public involvement programs.
>
> Members learned how to cooperate and function effectively in a group setting.
>
> Most of the skills that were learned are participatory types of skills. These include organizing and delivering reports and public speaking.

5.4.2 Double-Loop Learning

Double-loop learning involves the detection and correction of error in ways that modify an organization's underlying norms, policies and objectives. This type of learning can only emerge if there is a mismatch between intention and outcome. Of the two groups, only the CFPN engaged in double-loop learning as a consequence of its involvement in the Floodway expansion EA. The learning within the CFPN resulted in a clear transformation of its mandate and objectives.

Initially, the CFPN's mandate emphasized various issues related to flood protection and ice jamming along the Red River, north of the Floodway outlet (Interview Notes, April 15, 2005). Groundwater became a central focus of its mandate only after some of its hired experts had discovered contaminated water present in the Floodway (Interview Notes, April 21, 2005). In this case, the discovery of new information had caused the group to question its objectives and norms and rework its entire mandate. This mandate change was identified by all of the interviewed CFPN members. One respondent remarked that, "Our mandate evolved as we came together. We designed our mandate as we moved along". Furthermore, another respondent stated that, "The mandate changed when we devoted more effort on the groundwater issue. Groundwater was not an issue until we had discovered contamination of the Floodway water". In its closing statement at the CEC Hearings, the CFPN made the following comments:

> It was only through the work of our expert witnesses that we discovered that the City of Winnipeg was dumping raw sewage into the Floodway. This site is so contaminated that in other provinces it would have been immediately posted and determined to be a hazardous site and an order would have been given to clean it up. To the best of our knowledge, not only has it not been cleaned up, tests performed by our experts and by the City of Winnipeg indicate that sewage still flows into the Floodway.

The double-loop learning experienced by the CFPN contributed to the development of its organizational goals and objectives. The group continued to investigate groundwater issues rigorously throughout its involvement. As well, groundwater concerns became the focal point of the group's presentations at various open houses and public meetings. In summary, the participation of the CFPN in the Floodway expansion EA was substantially influenced by its double-loop learning experiences. No similar double-loop learning

outcome was revealed in the data pertaining to the CCCD. However, social learning contributed to the effectiveness of both groups in the Floodway expansion EA.

5.5 Summary

This chapter set out to investigate the linkages between individual learning and social learning. A description of organizational memory was provided. As well, impediments to the development of organizational memory were explored. Social learning is not possible until individual memories have been encoded in some form of organizational memory. An operational definition of social learning was presented. Lastly, this chapter explored single-loop and double-loop social learning outcomes experienced by the CFPN and the CCCD throughout their involvement in the Floodway expansion EA.

Chapter 6

Conclusions and Recommendations

6.1 Social Learning and Participatory Approaches in Natural Resource Management

Past attempts to control for the *'wicked'* nature of environmental and resource problems have often failed because of their inability to respond and adapt to complex situations. Expert-driven, hard-and-fast solutions are not likely to be successful when dealing with problems characterized by uncertainty and conflict. These types of problems have no definitive formulation, no stopping rule, and no test for a solution (Rittel and Webber, 1973). "There are no experts on these problems, nor can there be. Instead, we should establish and maintain a dialogue among the various interested parties" (Ludwig, 2001: 763). Social learning approaches, emphasizing meaningful public involvement, are ideal under these circumstances because they are adaptive by nature, embrace understanding and dialogue, and promote mutual learning and respect among stakeholders.

Public involvement in the Floodway expansion EA was required because the proposed project threatened to significantly affect the environment and people's livelihoods. Public involvement provides a forum for the use and integration of local and traditional knowledge, allows for comprehensive planning and decision making, and improves the transparency of the process. Furthermore, it assists in ensuring that the needs of the community are incorporated into design details and construction procedures. Moreover, the solicitation of public input throughout the decision-making process helps to prevent

conflict that may arise from unforeseen circumstances, contributes to resource management solutions that stand the test of time, promotes trust among stakeholders, and precludes the probability of delays that may add to the overall monetary cost of the project (Roberts, 1995).

This research contributes to the ongoing investigation into alternatives to top-down, expert-driven resource management approaches. It highlighted the importance of public involvement and social learning in natural resource management situations characterized by complexity, uncertainty and conflict. Linkages between individual learning and social learning were explored in an attempt to encourage dialogue and understanding among individuals and their groups. A description was also provided of the possible impediments and barriers to social learning. Through the investigation of important public involvement and social learning issues in the Floodway expansion EA, this research contributes to the growing body of literature focused on sustainable resource management.

6.2 Key Results and Conclusions

This research explored the linkages between individual and social learning in the context of public involvement in EA. Several similarities and differences were revealed between the learning outcomes of the CFPN and the CCCD. Further, possible impediments to organizational memory were examined in an attempt to identify a gap between individual and social learning. An explanation of how social learning can contribute to meaningful public involvement is provided later in the chapter. As well, conclusions and

implications are presented, and recommendations are proposed. Finally, strengths and weaknesses of this research are identified and future research needs and opportunities are suggested.

6.2.1 Individual Learning Outcomes

This study suggests that members from both the CFPN and the CCCD gained knowledge of various environmental issues as a result of their involvement in the Floodway expansion EA. All of the members interviewed from the CFPN believed that they had gained an increased understanding of several environmental aspects. Numerous members reported having developed a deeper understanding of groundwater issues. As well, various members expressed greater respect for the environment and a heightened level of knowledge of flooding and drainage issues.

The majority of CCCD members demonstrated a better understanding of groundwater issues and flooding issues. However, the greatest degree of learning experienced by CCCD members had to do with the potential impacts of an expanded Floodway on agricultural drainage in the region.

Several CFPN and CCCD members reported an increased understanding of technical features, procedural aspects and legal requirements. The data revealed that many of the CFPN respondents were quite knowledgeable of design revisions made to prevent the possibility of groundwater contamination. Further, many respondents demonstrated an

ability to describe details related to the scope of the project and the operating rules of the Floodway inlet structure.

All of the CCCD members were able to bring to mind learning related to technical features, political aspects and legal requirements. The data revealed that several respondents reported an increased understanding of design details. As well, various respondents reported becoming more familiar with project licensing requirements. Finally, a few respondents expressed a heightened understanding of public involvement aspects and EA governing bodies.

Both the CFPN and CCCD respondents reported acquiring at least some knowledge about the proponent (MFA) and other community groups participating in the Floodway expansion EA. All of the CFPN members reported an increased understanding of the MFA's role in Floodway expansion EA. As well, various members demonstrated knowledge of the interests and concerns of other individuals and communities involved in the process.

The majority of CCCD members reported an increased familiarity of the MFA and other community groups. Furthermore, various members expressed knowledge of the responsibilities and mandate of the MFA. As well, all members believed that they were more familiar with the issues and concerns of other community groups participating in the process.

These results suggest that public involvement in EA provides various opportunities for individuals to engage in learning. Furthermore, public involvement in EA is a good forum for individuals to learn about the environment, technology, communities and themselves. In the end, these findings show that individual learning through public involvement contributes to the awareness and empowerment of community members.

6.2.2 Group Learning Outcomes

The theory of action framework formed the basis of my investigation of social learning in the Floodway expansion EA. Social learning involves the formation of consensus views among group members. The collective actions of groups often provide evidence that social learning has occurred.

Single-loop learning takes place when there is a match or mismatch between intention and outcome. This type of learning often results in behavioral changes or changes in strategies and techniques. Both the CFPN and CCCD experienced single-loop learning that resulted in obvious changes in their behavior, strategies and techniques. Both groups reported changes that resulted in their deeper understanding of environmental factors. As well, both groups demonstrated changed views and greater appreciation of other stakeholders. In summation, both the CFPN and the CCCD reported having developed strengthened abilities in the following areas: public presenting, operating new technologies, conversing with government officials, dealing with media, and, working with other organizations. As a result of their learning, both groups expressed having strengthened abilities to participate effectively in the Floodway expansion EA.

Double-loop learning can only occur if there is a mismatch between intention and outcome. This type of learning involves the detection and correction of error in ways that modify an organization's underlying norms, policies and objectives. Of the two groups, only the CFPN demonstrated double-loop learning. In this case, the discovery of new information had caused the group to question its objectives and norms and rework its entire mandate. This mandate change was identified by all of the interviewed CFPN members. The learning that was experienced by the CFPN was instrumental in influencing its involvement in the Floodway expansion EA.

The evidence suggests that social learning is fundamental to the success of organizations participating in public involvement forums. Public involvement in EA provides an excellent opportunity for social learning about resource management activities that may potentially affect the natural environment and surrounding communities. Organizations that engage in social learning effectively will be better informed, thus leading to participation in EA that is both meaningful and of high value to decision makers.

6.2.3 Identifying the Gap Between Individual and Social Learning

Desirable social learning outcomes depend upon the effective communication of knowledge from the level of the individual to the level of the group. For social learning to occur, individual ideas and thoughts must first be embedded in organizational memory. Both the CFPN and the CCCD utilized various forms of organizational memory. Private

memory included the use of mental images and maps, while public memory was stored in flowcharts, minutes from meetings and mandates.

A gap between individual and social learning may be present if individual knowledge is prevented from being embedded in organizational memory. There were no major barriers to the development of organizational memory, thus there were no major gaps between individual and social learning. For the most part, the key individual outcomes were congruent with the major social learning outcomes. However, minor learning differences did exist which resulted from individual self-interests that were not reflective of the overall goals and objectives of the group. The knowledge of these individuals remained entrenched in their own private memories. In spite of this, the gap between individual and social learning did not significantly impede either group's ability to participate effectively in the Floodway expansion EA.

6.2.4 Impediments to Social Learning in Organizations

Neither the CFPN nor the CCCD encountered substantial impediments to the development of organizational memory, and thus it is no surprise that both groups experienced social learning throughout their involvement in the Floodway expansion EA. Most of the impediments highlighted earlier were insignificant in preventing social learning. However, in some cases, members from both the CFPN and the CCCD encountered difficulties grasping technical information introduced by the MFA in written documents and in oral presentations.

Several factors contributed to the social learning outcomes that were achieved by the CFPN and CCCD. Both groups were transparent in their decision-making and idea-sharing processes. Furthermore, both the CFPN and CCCD possessed strong leadership within their organizations. Finally, both groups effectively documented their activities and provided opportunities for members to engage in dialogue throughout the EA process.

For the most part, both groups were able to effectively process and reflect upon the knowledge of members. These results and the results regarding the lack of a significant gap between individual and social learning outcomes suggest the importance of leadership and fair and inclusive idea-sharing and decision-making processes in the dynamics of social learning. A reasonable conclusion is that these factors overrode the learning differences and learning difficulties reported above, and were paramount in shaping the social learning outcomes.

6.2.5 The Value of Social Learning in Public Involvement

Evidence from this study suggests that both the CFPN and the CCCD were satisfied with the public involvement opportunities provided throughout the EA process. However, members from both groups questioned whether they were being taken seriously and whether their concerns would be incorporated into the framework of an expanded Floodway. Various members from the CFPN felt that the MFA was given too much control over the design of the public involvement component and the determination of the scope of the project. Furthermore, the majority of CFPN members believed that the EA

process lacked transparency and were of the opinion that their group did not receive adequate funding. By comparison, CCCD members were divided in their views about whether they believed the EA process was transparent and were pleased with the amount of participant funding provided. In summation, members from both groups expressed frustration and discouragement over certain aspects of the EA process. However, on the whole, both the CFPN and the CCCD considered their involvement in the Floodway expansion EA to be meaningful.

Social learning can contribute to the overall success of an organization's participation in a public involvement forum. An organization that learns effectively is capable of conveying valuable knowledge to decision makers. Figure 8 illustrates how social learning enhances public involvement in natural resource management. Both the CFPN and the CCCD demonstrated an increased understanding of environmental factors and the ability to comprehend issues and concerns of other stakeholders. As well, both of these groups learned new skills and techniques that enabled them to participate effectively. The knowledge grasped by the CFPN and the CCCD contributed to their overall influence in the Floodway expansion EA. Ultimately, when applied to complex situations, social learning and public involvement contribute to sustainable resource management practices.

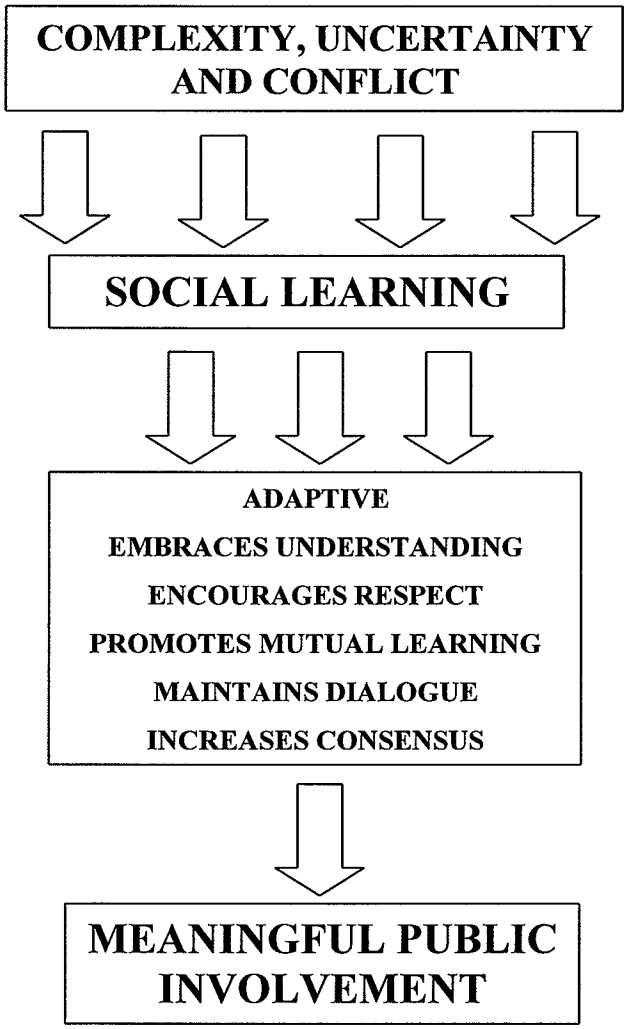

Figure 8 - The Value of Social Learning in Public Involvement

6.2.6 Summary

The evidence from this study suggests that doing an analysis of organizations participating in EA adds value and understanding to public involvement and how it is structured. It also adds value to understanding the communications and dynamics of groups participating in public involvement processes. Furthermore, this research recognizes the importance of identifying and addressing possible impediments to social learning in community organizations. Organizations that engage in social learning

effectively will be capable of making informed decisions which may contribute to their success in public involvement forums. In the end, social learning contributes to meaningful public involvement in natural resource management.

6.3 Recommendations

This section provides recommendations to community organizations for encouraging social learning, and to EA authorities for promoting meaningful public involvement opportunities.

6.3.1 Community Organizations

Based on the research findings and conclusions, a number of recommendations have been compiled for the purpose of encouraging social learning in community organizations. First, organizations should set up strong leadership bodies to facilitate group processes and initiate action on behalf of their concerns. Second, organizations should establish and maintain fair and inclusive idea-sharing and decision-making processes. Opportunities for dialogue and forums for conflict resolution are required. Third, it is recommended that organizations maintain documentation of group activities, objectives, strategies and goals. These documents should be available in various formats and accessible to all group members. Fourth, organizations should be attentive to the strengths and weaknesses of individual members. Whenever possible, organizations should hire professionals to conduct research and decipher technical reports.

6.3.2 EA Authorities and Proponents

Several recommendations are also imparted to EA authorities and proponents for the purpose of promoting meaningful public involvement and social learning in EA. First, EA authorities and proponents should establish and maintain early and ongoing public involvement opportunities. Stakeholders should be permitted to take part in scoping exercises at the onset of the EA process, for the purposes of identifying issues and concerns related to the potential impacts of the proposed development. This will contribute to enhanced communication and learning among individuals and groups. Second, transparency and openness should be maintained throughout the EA process. To accomplish this, EA authorities and proponents will be required to share and distribute information in a fair and effective manner (e.g., advertising public involvement events and publishing EA Findings). Third, adequate time and funding should be provided to intervening organizations. Participant funding assists organizations in hiring expert consultants, preparing presentations and attending public involvement events. Fourth, EA authorities and proponents should engage in collaborative decision-making and idea-sharing processes with stakeholders. For the purpose of soliciting valuable feedback, EA authorities should be mandated in legislation to provide training and education for organizations engaged in public involvement forums. This will contribute to mutual learning among all individuals, community organizations, EA authorities and proponents who are involved in the process. Fifth, an impartial entity should be commissioned with the tasks of determining the scope of the EA and designing the public involvement component. It is imperative that members of this committee do not have anything at

stake in the proposed development. This will help to build trust and promote respect and cooperation among stakeholders, EA authorities and proponents.

6.4 Research Evaluation and Future Direction

The strengths of this research were derived from the qualitative approach that was employed. This research was effective at exploring learning outcomes accrued by individuals and groups participating in the Floodway expansion EA. The data collected were valuable for revealing the opinions and understandings of members of both the CFPN and CCCD. Further, the qualitative nature of this research provided insight regarding the research participants in the context of their involvement in events and processes. Finally, the research design was appropriate for comparing the learning outcomes and public involvement experiences of two distinct organizations.

Weaknesses of this research were also identified. The outcomes of this study may provide insight when compared with similar studies. However, these results are unique to the circumstances under which they were investigated. Future studies with similar objectives may generate entirely different findings. Another weakness of this research relates to the voluntary nature of some of the data collection techniques employed. In particular, the success of interviewing was dependent upon the cooperation of a small group of key informants. Fortunately, there were only a few members from both groups who declined to be interviewed. The final weakness identified relates to the task of defining social learning. The literature review revealed several definitions, some similar

and others quite different. Given the situation, it was challenging to devise an appropriate definition of social learning for this research.

Additional research is needed in order to identify other suitable applications for social learning concepts in natural resource management. Further investigation of the linkages between individual and social learning is required to recognize additional impediments to group learning. Future research should focus on developing techniques for encouraging the formation of organizational memory and improving communication among group members. Further research is also required to determine the level of influence that community organizations have on the outcomes of public involvement and decision-making processes. Moreover, it would be beneficial to investigate the learning linkages between various stakeholder groups involved in a public forum. This would help to reduce conflict and promote dialogue and understanding among all groups. There are several opportunities to explore these topics and others in various resource and environmental management contexts (e.g., land use planning, environmental policy making, environmental education, etc.).

References

Alexander, D. (1999). Planning As Learning: Sustainability and the Education of Citizen Activists. *Environments,* 27(2), 79-87.

Argyris, C. (1977). Double Loop Learning in Organizations. *Harvard Business Review*, 55(5), 115-125.

Argyris, C. (1993). *On Organizational Learning*. Cambridge, MA: Blackwell Business.

Argyris, C., Schön, D. A. (1978). *Organizational Learning: A Theory of Action Perspective*. Reading, MA: Addison-Wesley Publishing Company.

Blann, K., Light, S., Musumeci, J. A. (2003). *Facing the Adaptive Challenge: Practitioners' Insights from Negotiating Resource Crises in Minnesota.* In Navigating Social-Ecological Systems, edited by F. Berkes, C. Folke and J. Colding, 210-40. Cambridge, U.K.: Cambridge University Press.

Blatner, K. A., Carroll, M.S., Daniels, S.E., Walker, G.B. (2001). Evaluating the Application of Collaborative Learning to the Wenatchee Fire Recovery Planning Effort. *Environmental Impact Assessment Review,* 21(3), 241-270.

Bumsted, J. M.(1997). *Floods of the Centuries: A History of Flood Disasters in the Red River Valley 1776-1997*. Winnipeg: Great Plains Publications.

Canadian Environmental Assessment Act, Canadian Environmental Assessment Agency(2003).

Cardinall, D., Day, J.C. (1998). Embracing Value and Uncertainty in Environmental Management Planning: A Heuristic Model. *Environments,* 25(2 & 3), 110-125.

Coalition for Flood Protection North of the Floodway. (2004). *Comments on the Red River Floodway Expansion Project's Environmental Impact Statement*. Retrieved November 10, 2005, from http://www.gov.mb.ca/conservation/envapprovals/registries/redriverfloodway/eis/comments/organizations1.pdf

Creighton, S. C. (1999). *Creighton Thesis: Learning To Plan For Integrated Water Resources Management In British Columbia.* Retrieved August 13, 2004, from http://www.scarp.ubc.ca/thesis/creighton/Chapter5.html

Creswell, J. W. (1994). *Research Design: Qualitative and Quantitative Approaches*. London: Sage Publications.

Currie, R. S., Williamson, D.A., Brigham, M.E. (1998). *A Preliminary Assessment of Environmental Impacts Associated with the 1997 Red River Flood, with Focus on Water Quality,* Ottawa: International Red River Basin Task Force.

Dewey, J. (1963). *Liberalism and Social Action.* New York: Capricorn Books G.P. Putnam's Sons.

Diduck, A. P. (2004). Incorporating participatory approaches and social learning. In B Mitchell (Ed). In *Resource and Environmental Management in Canada: Addressing Conflict and Uncertainty* (3rd ed.). Toronto: Oxford University Press, 497-527.

Diduck, A. P., J. Moyer, and E. Briscoe. (2005). A Social Learning Analysis of Recent Flood Management Initiatives in the Red River Basin, Canada: Systemic Impediments to Double-loop Learning. In *Sustaining Our Futures: Reflections on Environment, Economy and Society*, edited by D. Shrubsole and N. Watson. Waterloo, ON: University of Waterloo, 127-164.

Diduck, A. P., Mitchell, B. (2003). Learning, Public Involvement and Environmental Assessment: A Canadian Case Study. *Journal of Environmental Assessment Policy and Management,* 5(3), 339-364.

Dixon, N. M. (1993). *Organizational Learning.* Ottawa: Conference Board of Canada.

Environment Act (C.C.S.M. c. E125) Manitoba Regulation 164/88 Classes of Development Regulation, Province of Manitoba (1988).

Emergency Preparedness Canada (1999). *A Preliminary Assessment of the Effectiveness of Flood Damage Reduction Measures in Canada.* Ottawa: Environment Canada.

Federal Screening Report. (2005). *Screening Report Red River Floodway Expansion Project.* Winnipeg: Infrastructure Canada.

Fiorino, D. J. (2001). Environmental Policy As Learning: A New View of an Old Landscape. *Public Administration Review,* 61(3), 322-334.

Fitzpatrick, P., Sinclair, J.A. (2002). Learning Through Public Involvement in Environmental Assessment. *Journal of Environmental Management,* 67(6), 161-174.

Friedmann, J. (1987). *Planning In The Public Domain: From Knowledge to Action.* Princeton, NJ: Princeton University Press.

Gamble, D. J. (1978). The Berger Inquiry: An Impact Assessment Process. *Science,* 199(3), 946-953.

Gibson, R. (1993). Environmental Assessment Design: Lessons from the Canadian Experience. *The Environmental Professional,* 15, 12-24.

Haas, P. M. (2000). International Institutions and Social Learning in the Management of Global Environmental Risks. *Policy Studies Journal,* 28(3), 558-575.

Haque, E. C., Kolba, M., Morton, P., Quinn, N.P. (2002). Public involvement in the Red River Basin management decisions and preparedness for the next flood. *Environmental Hazards,* 4(1), 87-104.

Hartvigsen, G., Kinzig, A. and Peterson, G. (1998). Use and Analysis of Complex Adaptive Systems in Ecosystem Science: Overview of Special Section. *Ecosystems,* 1(5), 427-430.

Holling, C. S., Walters, C.J. (1990). Large-Scale Management Experiments And Learning By Doing. *Ecology: Ecological Society of America,* 71(6), 2060-2068.

Hurst, W. D. (1949). *The Red River Valley Problem.* Winnipeg: University of Manitoba.

International Joint Commission [IJC] (1997). *The International Joint Commission's Interim Report to Governments—December 1997.* Ottawa: IJC.

International Joint Commision [IJC] (2000). *Living With the Red: A Report to the Governments of Canada and the United States on Reducing Flood Impacts in the Red River Basin.* Winnipeg: IJC.

Kontzamanis-Graumann-Smith-Macmillan Incorporated consulting engineers and project managers [KGS] (2000). *International Joint Commission Flood Protection for Winnipeg Part 3 - Pre-Feasibility Studies.* Winnipeg: KGS Group.

Krasny, M. E., Lee, S. (2002). Social Learning as an Approach to Environmental Education: Lessons From a Program Focusing on Non-indigenous, Invasive Species. *Environmental Education Research,* 8(2), 101-119.

Kuhn, T.S. (1970). *The Structure of Scientific Revolutions.* Chicago: University of Chicago Press.

Lawrence, D. P. (1994). Designing and Adapting the EIA Planning Process. *The Environmental Professional,* 16(11), 2-21.

Ludwig, D. (2001). The Era of Management Is Over. *Ecosystems* 4(8), 758-764.

Manitoba Clean Environment Commission. (2005). *Report on Public Hearing: Red River Floodway Expansion.* Winnipeg: MCEC.

Manitoba Floodway Expansion Authority. (2004). *Proposed Floodway Expansion: Environmental Impact Statement.* Winnipeg: MFEA.

Manitoba Floodway Authority. (2006). *What is Floodway Expansion?* Retrieved January 31, 2006, from http://www.floodwayauthority.mb.ca/floodway_expansion.html

Maxwell, J. A. (1996). *Qualitative Research Design: An Interactive Approach.* Thousand Oaks, CA: SAGE Publications.

Merriam, S. B., Caffarella, R.S. (1999). *Learning in Adulthood: A Comprehensive Guide* (2nd ed.). San Francisco: Jossey-Bass Publishers Incorporated.

Miller, G., Dingwall, R. (1997). *Context and Method in Qualitative Research.* London: SAGE Publications.

Mitchell, B. (2002). *Resource and Environmental Management* (2nd ed.). Toronto, Ontario: Pearson Education Limited.

Morris-Oswald, T., Simonovic, S.P, and Sinclair, J. (1999). *Efforts in Flood Damage Reduction in the Red River Basin: Practical Considerations.* Winnipeg: University of Manitoba.

National Round Table on the Environment and the Economy [NRTEE]. (1993). *Building Consensus for a Sustainable Future: Guiding Principles.* Ottawa: NRTEE.

Neuman, L. W. (2003). *Social Research Methods: Qualitative and Quantitative Approaches* (5 ed.). New York: Allyn and Bacon.

Pahl-Wostl, J. (2002). Towards Sustainability in the Water Sector - The Importance of Human Actors and Processes of Social Learning. *Aquatic Sciences,* 64(4), 394-411.

Palerm, J. R. (2000). An Empirical-Theoreical Analysis Framework for Public Participation in Environmental Impact Assessment. *Journal of Environmental Planning and Management,* 43(5), 581-600.

Parson, E.A., Clark, W.C. (1995). *Sustainable Development as Social Learning: Theoretical Perspectives and Practical Challenges for the Design of a Research Program. In Barriers and Bridges to the Renewal of Ecosystems and Institutions*, edited by L.H. Gunderson, C.S. Holling and S.S. Light, 428-460. New York: Columbia University Press.

Red River Floodway Operation Review Committee (1999). *A Review of the Red River Floodway Operating Rules.* Winnipeg: Red River Floodway Operation Review Committee.

Rittel, H., Webber, M. (1973). Dilemmas in a General Theory of Planning. *Policy Science,* 4(2), 155-169.

Roberts, R. (1995). *Public Involvement: From Consultation to Participation. In Environmental and Social Impact Assessment*, edited by F. Vanclay and D.A. Bronstein, 221-246. New York: John Wiley and Sons.

Saarikoski, H. (2000). Environmental Impact Assessment (EIA) as Collaborative Learning Process. *Environmental Impact Assessment Review,* 20(6), 681-700.

Senge, P. M. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization.* New York: Doubleday Dell Publishing Group, Incorporated.

Sinclair, A. J., Diduck, A. P. (2001). Public Involvement in EA in Canada: A Transformative Learning Perspective. *Environmental Impact Assessment Review,* 21(22), 113-136.

Sinclair, A. J., Diduck, A. P., Fitzpatrick, P. (2002). Public Hearings in Environmental Assessment: Towards a Civics Approach. *Environments,* 30(1), 17-35.

Sinclair, A. J., Diduck, A. P. (2005). *Public Participation in Canadian Environmental Assessment: Enduring Challenges and Future Directions. In Environmental Impact Assessment: Participation and Practice*, edited by K.S. Hanna, 53-74. Toronto: Oxford University Press.

Smith, M. K. (2001). *Chris Argyris: Theories of Action, Double-loop Learning and Organizational Learning.* Retrieved July 14, 2004, from http:www.infed.org/thinkers/argyris.htm.

University of North Dakota. (2005). *Red River Basin.* Retrieved November 15, 2005, from http://www.undeerc.org/waffle/gallery/category1.asp

Webler, T., Kastenholz, H., Renn, O. (1995). Public Participation in Impact Assessment: A Social Learning Perspective. *Environmental Impact Assessment Review,* 15(5), 443-463.

Webler, T., Tuler, S., Krueger, R. (2001). What is a Good Public Participation Process? Five Perspectives from the Public. *Environmental Management,* 27(3), 435-450.

Appendix A

Interview Guide

-Interviewee: _____
-Date: _____
-Location: _____
-Duration: _____
-Interviewer: _____

A. I would like to begin by asking you a few questions about your involvement in the Red River Floodway Environmental Assessment process.

1) How long have you and your organization been involved in flood management issues in the Red River Basin?

2) How would you describe your role and responsibilities in the organization?

3) Could you describe or give some examples of the various ways you participated in the Floodway Expansion EA process?
   - workshops
   - open houses
   - hearings
   - focus groups
   - information booths

4) Why are you interested in the current Red River floodway EA? What are your main concerns?

5) What do you think about the public involvement component of this EA?

6) Do you feel that the public involvement process of the Red River Floodway EA has been fair? Could you please explain your response?

7) Are you satisfied with the public involvement opportunities that were made available?

8) What could be done to improve the public involvement process?

9) Do you feel that your group was adequately funded? Could you please explain your response?

10) What are your feelings towards the extent in which your group was able to influence the decision making process of the Floodway Expansion EA?

11) Do you believe that the Floodway Expansion EA was transparent? Did the proponent share and distribute information in an effective and fair manner? If "yes", please explain. If "no", please explain.

12) Do you feel that your interests in the Floodway Expansion EA were adequately addressed? If "yes", please explain. If "no", please explain.

13) Do you feel as though the involvement of your group in the Floodway Expansion EA was meaningful? If "yes", please explain.

B. This next section deals with learning outcomes that you may have experienced as a result of your involvement in the Floodway Expansion EA.

14) Through participating in the Floodway Expansion EA, did you gain an increased understanding of ecological/environmental aspects? If so, please explain.

15) Did you learn anything new about flooding issues? If so, please explain.

16) Did you learn anything new about groundwater issues? If so, please explain.

17) Did you learn anything new about drainage issues? If so, please explain.

18) Through your involvement have you learned anything about sustainable floodplain management? If so, what have you learned?

19) Through participating in the Floodway Expansion EA, did you gain an increased understanding of the technical aspects of the project? If so, could you please explain?

20) Through participating in the Floodway Expansion EA, did you gain an increased understanding of legal aspects? If so, please explain.

21) Through participating in the Floodway Expansion EA, did you gain an increased understanding of political aspects? If so, please explain.

22) Is there anything else that you learned about the EA process from your involvement? If so, please explain.

23) What have you learned about the nature of public involvement in EA?

24) Are you more familiar with EA governing bodies and requirements as a result of your involvement? If so, please explain?

25) Through participating in the Floodway Expansion EA, did you learn anything about the proponent of the project, the proponent being the Manitoba Floodway Authority? If "yes", what did you learn about the proponent?

26) Through your involvement in the Floodway Expansion EA, did you learn anything about other community groups that participated in the public involvement process? If "yes", could you please explain what was learned?

27) You may have talked to this already, but is there anything else that you learned as a result of your involvement in the floodway Expansion EA?

28) Have your thoughts/views of the proponent changed as a result of your involvement in the Floodway Expansion EA? If so, please explain.

29) Have your thoughts/views of other community groups changed as a result of your participation in the Floodway Expansion EA? If "yes", please explain.

30) Has your sense of the natural environment changed as a result of your involvement in the Floodway Expasion EA? If so, please explain.

31) Through participating in the Floodway Expansion EA, do you value the natural environment any more or less? If "yes", please explain. If "no", please explain.

32) As a result of your group's participation in the Floodway Expansion EA, were any new skills developed among the members of the group? If "yes", what were these skills?

33) Has the mandate of your group changed at all as a result of participating in the Floodway Expansion EA? If "yes", please explain what was learned and how it led to changes in the mandate.

34) Do your own concerns differ at all in any way from those of your organization? If so, how do they differ?

35) Do you think that there are differences between what you have learned and what your organization has learned? If so, what are these differences and why do they differ from what was learned by the organization?

C. Thank you for your time and cooperation. I just have a few final questions before I wrap this up.

36) Would you mind if I contacted you for another interview at a later date? If I do, you will be asked for a separate consent at that time.

37) Could you give us some names of other people in the organization that we could talk to?

Appendix B

Observation Guide

CEC hearings, February 14 - March 8, 2005

The physical setting

- What is the physical environment like?
- What objects, resources, technologies are in the room?
- Draw a diagram of the room and take a picture.

Activities and interactions

- When does the hearing start?
- When does it break?
- When does it end?
- How do people interact with one another?
- How formal/informal are the proceedings?
- Are the purpose of the hearing, the agenda, and the rules made clear?
- What are the rules?
- Are there any informal or unplanned activities?
- What does not happen, especially if it should have happened?

The parties

- Who is here?
- How many people?
- Who is not here that should be here?
  - The commission
  - The Floodway authority and its consultants (What firms are they from?)
  - The regulators (What departments are they from?)
  - The interveners
  - The general public
  - The media

Presentations and questioning

- What is the content of the presentations and the questioning?
  - Focus on substance rather than on verbatim reproduction.
  - Look for key and symbolic words in people's remarks that will stand out later.
  - Concentrate on the first and last remarks in each presentation.
- What is the expression/tone of the presentations and the questioning?
- What is the reaction (verbal and nonverbal) from the people around you?

Environment for learning

- Is the information the parties provide timely, accurate, complete, and understandable?
  - Collect copies of materials that are distributed.
- Are any of the parties overtly manipulative or coercive?

- Is it a safe and collegial environment to express alternative perspectives/values/goals (including different ideas about the project's purpose, need, and implementation)?
- Is it a safe and collegial environment to reflect upon and discuss underlying assumptions/presumptions/values/goals?
- Are all parties given equal/equitable opportunities to voice their concerns/issues?
  - Are the rules applied consistently and fairly?
- Do you have a sense that the arguments will be evaluated in a fair and objective manner?
  - Does it seem that key decisions have been predetermined?

My own behavior and thoughts

- Is my role affecting the scene?
- What do I say or do?
- What are my thoughts feelings, hunches, initial interpretations, and working hypotheses about what is going on?

Appendix C

Interview Consent Form

Research Project Title: Exploring the Links Between Individual and Social Learning in the Red River Floodway Environmental Assessment

Researcher: Graeme Hayward, Natural Resources Institute, University of Manitoba

Sponsor: Social Sciences and Humanities Research Council of Canada

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you a basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

The purpose of this research is to investigate public involvement and social learning in environmental assessment (EA). I am studying the proposed expansion to the Red River Floodway to learn more about how to involve citizens in decision making about flood management. I also want to determine if social learning and public participation in EA can contribute to the development of sustainable resource management practices. Your participation in this study will take the form of a personal interview, which should last for approximately 60 minutes. I would like to obtain a more complete understanding of your participation in the floodway EA and get your views on the issues noted above. Our meeting is part of an initial round of interviews I am doing regarding the expansion to the floodway.

There are no known or anticipated risks to your participation in this study. In addition, your participation is entirely voluntary. You may withdraw from the interview at any time, and/or refrain from answering whatever questions without any prejudice or consequence.

I would like to audiotape the interview for the sake of accuracy, but if you prefer that I not do so I will make handwritten notes of our discussions. All information you provide will be treated as confidential, and you will not be identified by name in any report or publication resulting from this study. Interview tapes and notes will be transcribed and entered onto my computer hard disk. Backup copies of the data will be stored on CDs. The original tapes and notes, computer hard disk and backup disks will be stored in my office and will be inaccessible to anyone other than my supervisor and myself. Raw data will be destroyed when they are no longer required, likely upon completion of any subsequent reports or publications.

I expect to complete the study in late 2005 and will provide you with an executive summary of the research at that time, if you would like one. If you have any questions about the progress of the research in the meantime, please do not hesitate to contact me.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

Principal Researcher
Name/Title:
Address:
Telephone Number:
E-mail:

Supervisor
Name/Title:
Address:
Telephone Number:
Fax:
Office:
E-mail:

This research has been approved by the University of Manitoba Joint Faculty Ethics Review Board. If you have any concerns or complaints about the project you may contact my supervisor (name), at (###) ###-#### or the Human Ethics Secretariat at (###) ###-####.

A copy of this consent form has been given to you to keep for your records and reference.

_____

Participant's Signature Date

_____

Researcher's Signature Date