A MULTIPLE CASE STUDY OF COMMUNITY-BASED WATER MANAGEMENT INITIATIVES IN NEW BRUNSWICK

by

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ABSTRACT

The call for wise use of finite resources such as water is becoming more pervasive as the insecurity of the world and the Canadian freshwater situation is being realized. In this era of sustainability, the Canadian Water Resources Association has taken a lead role by developing sustainability principles which echo the emerging paradigms of integrated resource management and full-value recognition. Despite the release of such principles, a knowledge void is evident between emerging paradigms and current practices at a community level.

The purpose of this research was to describe and analyze the institutional organization of community-based water management initiatives in New Brunswick in order to determine if these initiatives possess the elements necessary to sustainably manage water resources. The research purpose was associated with three central questions. These questions were directed at: 1) managing water resources in accordance with established integrated resource management components, 2) a consideration of the full range of resource values, and 3) implementing integrated resource management strategies or approaches.

A multiple-case study method was employed with data collected through interviews, document analysis, and direct observation. Case and cross-case analysis were conducted by simple pattern matching and subsequent explanation building was guided by a theoretical template. Results are discussed in light of integrated resource indices which constituted the theoretical template. Although cross-case consistency was only reached in a few of the elements, findings confirm that initiatives studied reflect many of the characteristics associated with sustainability and constitute an important scale for the nested basin ecosystem approach for water management. Recommendations emphasize the primacy of interactive strategic planning in community-based organizations and were offered to further the process of sustainable water management.

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CHAPTER ONE

STUDY INTRODUCTION AND OVERVIEW

Introduction

Water is a precious and finite natural resource, one which is essential to all life and vital to ecological, economic and social well being. Yet water is often wasted and degraded. Therefore, we face both individual and collective responsibilities to use and manage water resources wisely. This will only be accomplished as we recognize the intrinsic value of water and practice conscious and committed stewardship, recognizing that precious heritage must be safeguarded for future generations (Canadian Water Resources Association, 1994).

Such calls for the wise use and management of the world's water resources are becoming more pervasive. The message is especially important to Canada given the current situation of the country's water resources.

Within Canada's boundaries there are 755,165 square kilometres of freshwater reserves and some of the longest rivers in the world, such as the MacKenzie, the St. Lawrence, the Nelson, the Yukon and the Columbia (Bryan, 1972). Perhaps most importantly, Canada contains "nine per cent of the world's renewable supply of freshwater" (Government of Canada, 1990, p. 31-32). Because of this apparent abundance, many Canadians perceive that the country has a limitless supply of water that is suitable for all purposes (Bryan, 1972; Foster and Sewell, 1981; Rueggeberg and Thompson, 1984; Bruce and Mitchell, 1995). However, as more is learned about water resources, it is increasingly clear that the amount of freshwater which is both accessible and reliable in Canada is considerably less than most believe and its quality and quantity vary drastically by region (Foster and Sewell, 1981; Kreutzwiser, 1991).

In addition to this misperception, two important developments compound the reality of Canada's freshwater situation. First, there is an increasing demand for the country's water resources to satisfy multiple purposes (Pearse, Bertrand and MacLaren, 1985; Kreutzwiser,

1991). Significant changes are evident due to the growing demand for withdrawal uses such as drinking water, and in-stream uses such as recreation. Second, many water resources are not of sufficient quality for the multi-purposes demanded (Pearse, et al., Government of Canada, 1990). Acid rain, pesticides and a myriad of other pollutants have reduced the quality of much of the freshwater resources.

Contributing further to the situation is the fact that water management in Canada is a multi-jurisdictional responsibility and the concern of a host of agencies and organizations, both governmental and non-governmental. In the province of New Brunswick alone, the 11,300 inland surface water bodies fall under the jurisdiction of several federal, provincial and municipal departments and agencies and a wide variety of non-governmental organizations are involved in activities such as lobbying, advocacy, education, research and management. Currently, there are approximately twelve community-based organizations in the province with interests in watersheds, basins, or sub-drainage basins. Representative of these groups are the: Miramichi River Environmental Assessment Committee, Bathurst Sustainable Development Project, Trout Creek Model Watershed Committee, Eastern Charlotte Waterways, and St. John River Society.

In response to the increasing concern for water, as well as all other natural resources, the General Assembly of the United Nations formed the World Commission on Environment and Development with a mandate to develop “a global agenda for change” (World Commission on Environmental Development [WCED], 1987, p.8-9). In their landmark report entitled Our Common Future, the concept of sustainable development was put forth. Sustainable development is described as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p.47). Since the release of this report, sustainable development has been placed on the economic, political and social agendas of most developed nations, including Canada.

Despite the broad-based support which has emerged for the basic idea of sustainable development, the concept is undergoing considerable scrutiny. Debate ranges from

philosophical discussions through to problems of practical implementation (Worster, 1995; Carley and Christie, 1993). However, according to Elkin “sustainability is not so much an end in itself, it is, or should be, a catalyst to genuinely creative thinking and practice” (1990, p. 60). He points out that sustainability is a way to address the problems facing the global environment and the problems are not solved by producing a sustainable outcome, but by producing principles and practices that bring environment and economy in line. Similarly, Nelson and Edsvik (1990) and Sadler and Jacobs (1990) agree that sustainable development is a process rather than an utopian end state and that it should be looked upon as a guide for the development of appropriate principles and practices. Currently, all levels of government in Canada, and elsewhere, are attempting to create sustainable development and sustainable management policies and practices. Many sectors such as forestry, agriculture, parks, tourism and mining are addressing the issue through the development of principles. Of concern to this study are the initiatives being undertaken in the area of water resource management by community-based organizations.

In Canada, the Canadian Water Resources Association (CWRA), an organization which has had an enduring and profound presence in water management for 50 years, has taken a lead role. Following a one and one half year consultation process with all provinces and territories in the country, the CWRA prepared a set of sustainability principles for water management. These principles focus on a genuine commitment to integration through such actions as: the linking of multiple and often conflicting purposes, means and participants in decision-making; the recognition and balancing of social, economic and environmental values and limits; the use of negotiation and mediation to seek consensus; the encouragement of broad-based consultation and participation; the employment of strategic and integrative planning; and, the acknowledgement of and provision for multiple perspectives in decision-making (CWRA, 1994).

At the time the principles were released in June 1994 it was strongly suggested that they be re-assessed regularly to refine them in light of experience (CWRA, 1994). However,

since their release, research which could form the bases for such an assessment has been slow to develop. A recent book, Practising Sustainable Water Management: Canadian and International Experiences (Mitchell and Shrubsole, 1997), can be considered a new stage in the understanding of sustainability and its expression in water management. Such efforts reinforce the need for a critical examination of water management efforts which purport a sensitivity to sustainability. In essence, this type of research may help resolve some of the controversy about the myths and realities associated with sustainability and contribute to the efforts currently being directed toward water management by examining existing principles and practices and proposing adjustments and alternatives.

New Brunswick is one of many provinces in which an examination of water management may be undertaken. The province contains approximately twelve community-based organizations that are involved with the management of water resources. These organizations are of particular interest because they appear to offer a meaningful opportunity for the description and critical analysis of the way in which the concept of sustainable development is expressed in water management. Many of these organizations claim to be founded on the principles of sustainable development while others, by their very nature reflect some of the characteristics associated with sustainable development. For example, they emphasize local involvement or a bottom-up approach to planning and management (Carley and Christie, 1993; Sellers, 1995; Singh and Titi, 1995). They take an ecosystem or sub-basin approach considered preferable for resource co-management and a nested basin ecosystem approach (Pinkerton, 1989; Bruce and Mitchell, 1995; Mitchell and Shrubsole, 1997; Mitchell, 1997), and they ameliorate the jurisdictional challenges surrounding government agencies (H. Collins, personal communication, January 28, 1997).

While it would be naive to think that these community-based water management organizations hold all the answers, they may contribute to the understanding of the operationalization of sustainable development and the changing role for organizations and institutions involved with water management. As Manning suggests, “a critical step [toward

sustainable development] will be to identify success stories; what works in practice, why does it work, and what can we learn from good examples which can be replicated elsewhere” (1992, p. 8).

Study Purpose and Research Questions

The purpose of this research is to describe and analyse the institutional organization of community-based water management initiatives in New Brunswick in order to determine if these initiatives possess the elements necessary to sustainably manage the water resources of the province. Judgements related to sustainability stem from the principles developed by the CWRA and are based on a set of indices that qualitatively measure the degree of integration amongst the elements.

The research purpose is associated with three central questions.

Research Question One - Do the community-based organizations in New Brunswick manage water resources in accordance with established integrated resource management components?

This first question addresses general theory and strives to gain an understanding of the consideration the community-based organizations give to integration. The Canadian Water Resources Association proposes water management initiatives with a sustainability sensitivity should reflect specific principles related to integration and associated literature presents specific indices of integration (Mitchell and Shrubsole, 1994; Mitchell, 1997). These indices are: multiplicity of means, purpose and participants; blending of resource sectors; use of resource management as a mechanism for social and economic change; and striving for accommodation and compromise. The underlying assumption is that low levels associated with any or all of these indices suggest operational barriers to water management sustainability.

Research Question Two - Do the community-based organizations concerned with water management in New Brunswick consider the full range of resource values?

The second question is a product of history and theory. Historically, natural resource managers have held narrow orientations toward products with market possibilities. The end goal of sustainable development, with an emphasis placed on the environment, necessitates a different management orientation. A system for environmental planning, management and decision-making has been proposed by deGroot (1992) which attempts to recognize the “full value” of natural resources to humans. To direct managers he suggests that natural systems have four broad functional categories. These four functional categories are: 1) regulation, 2) carrier, 3) production, and 4) information. The underlying assumption is that failure to recognize the full range of resource values suggests a lack of commitment or understanding to integration and sustainability.

Research Question Three - Do community-based organizations in New Brunswick implement integrated resource management strategies or approaches in their organization and operation?

The intent of this question is to determine if the key strategies for integration are present in the operational arrangements of the water management organizations. Literature suggests specific approaches or strategies for integration in sustainable resource management (Land, 1986; WCED, 1987; Manning, 1992; Carley and Christie, 1993; Loomis, 1993; Mitchell and Shrubsole; 1997). Indices for integration proposed by Lang (1986) include: 1) strategic planning where there is evidence of capacity to prioritize, focus and develop actions to realize goals and objectives; 2) interactive planning where there is evidence of multi stakeholder participation and communication; and 3) capacity to facilitate multiple perspectives where there is evidence of organization evolution and maturation in response to changing circumstances. The underlying assumption is that the absence of these indices suggests operational weakness in the implementation of sustainable management and development.

Organization

The arrangement and nature of chapters which constitute this thesis are described subsequently. Chapter Two is a review of literature pertinent to the study. Generally, the review focuses on topics central to water resource management and explores two themes. The first theme provides a contextual understanding of water resource management in Canada. The second considers emerging resource management paradigms that are gaining acceptance by those involved in the realm of water management.

Chapter Three addresses methodological issues relevant to this undertaking. The research foundations section presents the rationale for using the multiple-case study method. The research design section outlines the manner in which the study's questions and propositions are linked to data collection and analysis. Integral to data collection and analysis is a theoretical framework which consists of two axes. The first axis includes five managerial elements that are common constituents of all institutional arrangements. The second axis is composed of eight indices of integration as previously discussed in the context of the research questions. Analysis occurs through applying the indices to managerial elements to determine if the organization exhibits characteristics symptomatic of integration.

The results of data collection form the body of Chapter Four. These are a synthesis of the data collected through three methods - document analysis, semi-structure interviews and direct observations. Results are presented within the five managerial elements examined in the five organizations studied. These organizations include: The Miramichi River Environmental Assessment Committee, The Bathurst Sustainable Development Project, The Trout Creek Model Watershed Committee, Eastern Charlotte Waterways, and The St. John River Society.

Chapter Five is organized around the analysis of results presented in the preceding chapter and the additional cross-case analysis. Within each, analysis is provided according to sustainable water management principles. The organizational elements of each case were examined for the presence of characteristics symptomatic of integration. The examination

was based on specific indices of integration and the characteristics were qualitatively judged to be strongly, moderately or weakly exhibited. As an outcome of this analysis, profiles of symptomatic characteristics present in each case were generated which formed the basis for the cross-case analysis.

In Chapter Six the three central questions associated with this research were addressed. Discussion within each question stems from the judgements made utilizing the indices of integration in the cross-case analysis and from associated literature. Ultimately, the impetus for undertaking the research, to determine if the community-based organizations studied posses the elements necessary to sustainably manage the water resources of New Brunswick, was answered. Recommendations were offered in the areas of sustainable water management, methodological consideration and future research directions.

Study Delimitations and Limitations

The following delimitation is knowingly imposed on the research by the author. As the process of water management in New Brunswick is very complex and multi-jurisdictional, this study examines only community-based water resource management entities which focus is on freshwater and have a boundary of a watershed, drainage or sub-drainage basin.

Limitations also are acknowledged in undertaking this research. Although replication logic used in the case study approach is distinct from the sampling logic used in experimental research, the number of cases can be a limitation. For the purposes of this study a replication logic as suggested by Yin (1994) has been followed. The replication logic uses a total of five cases to ensure confidence in the findings (Yin 1994). Finally, the case study design has often been limited due to content validity, external validity, reliability and generalizability. The methodological considerations provided to minimize these threats are presented in Chapter Three, and although attention has been given to these particular issues, they remain limitations.

All aspects of this undertaking were carried out by the author who also served in the capacity of principle investigator for all field work. Although this consistency aids reliability,

validity and subjectivity remain an issue in research of this nature. Specific actions taken to minimize these limitations which are inherent in research of a descriptive/analytical nature are outlined in Chapter three.

CHAPTER TWO

LITERATURE REVIEW

Purpose

The literature review explores the central topic of water resource management. Two broad themes form the focus for the review. The first provides a contextual understanding of water resource management in Canada. Particular emphasis is placed on managerial strategies and jurisdictional responsibilities of the federal government, the provincial government of New Brunswick, and non-governmental managing agencies. The second theme considers emerging resource management paradigms that are gaining acceptance by those involved in the realm of water management.

Natural Resource Management

At this point it is important to begin by defining the concept of “natural resource management”. O’Riordan (1971, p. 19) suggests that it,

may be defined as a process of decision making where by resources are allocated over space and time according to the needs, aspirations, and desires of man within the framework of his technological inventiveness, his political and social institution, and his legal and administrative arrangement. Resource management should be visualized as a conscious process of decision involving judgement, preference and commitment, whereby certain desired resource outputs are sought from certain perceived resource combinations through the choice among various managerial, technical, and administrative alternatives.

While O’Riordan (1971) captures the essence of natural resource management, Mitchell explains natural resource management in a more succinct and pragmatic manner as “the actual decisions concerning policy or practice regarding how resources are allocated and under what conditions or arrangements resources may be developed” (1989, p. 3).

Clearly, individuals who manage natural resources have a formidable task. To demonstrate the complexity of natural resource management Krueger and Mitchell (1977)

present five emerging perspectives which can guide management. These are bio-physical, economic, social, political, legal, institutional and technological. Each perspective requires consideration along temporal and spatial dimensions. Further, contemporary resource management has evolved into a multi-dimensional science in which decision making expertise is now required in a host of domains. In addition to resource development, management is assigned the responsibility to address issues and problems associated with resource planning and analysis, conservation, regulation, protection, education, and communication, among others. To further compound the situation natural resource managers “do not have the luxury of studying and contemplating forever before making decisions” (Krueger and Mitchell, 1977, p. 6).

From this overview it is obvious that the term encompasses a myriad of elements. Fundamentally, resource management “represents the actual decisions concerning policy or practice regarding how resources are allocated and under what conditions or arrangements resources may be developed” (Mitchell, 1989, p. 3). Of particular concern to this research is the topic of water resource management.

Water Resource Management

The idea of managing water is not new; the discipline of water resource management has existed for a considerable length of time (Kinder, 1988). The purpose of water resource management is to provide water of acceptable quality in a sufficient quantity to meet the needs of the human population (Haith and Loucks, 1976; Goodman, 1984; Environment Canada, 1987; Kinder, 1988; Organization for Economic Co-Operation and Development [OCED], 1989).

As the water resource management field has developed, the purpose of water resource management has changed very little. Even though the purpose remains simple, the field's complexity mirrors that of contemporary natural resource management. Mitchell (1975, p. xi) captured the ubiquitous nature of research in the water resource management realm;

Research may focus upon one or more dimensions: biophysical, economic, social, political, institutional, or technological. Attention may be given to different temporal (past, present, future) or spatial (local, regional, national, international) scales. A variety of topics is available: demand, supply, quality, flooding, hydro-power, transportation, recreation.

To encapsulate the development of a field with such breadth it is useful to examine the general strategies and approaches undertaken.

General strategies that have been undertaken to meet the purpose of water resource management may be divided into supply and demand. Within these general strategies many important approaches have emerged in the literature. It is generally accepted that “over the past 50 years, water resources planning has evolved from a relatively simple methodology to a complex procedure” (Goodman, 1984, p. 6).

Traditional water management literature was straightforward. The general “supply management” strategy involved the manipulation, harnessing, storing, and regulating of natural water systems to meet human needs (Goodman, 1984; Pearse, Bertrand and MacLaren, 1985; Tate, 1991). This strategy was logical as it developed the most convenient and cost effective sources first and subsequently explored more costly less accessible sources (Pearse et al., 1985). Under this general strategy, research focused on engineering and economic factors dealing with such topics as hydrology, hydraulics, structures, service, and economic cost (Goodman, 1984). A supply management strategy was logical as long as quality water was plentiful.

Canadian history confirms the logical nature of a supply management approach. The aboriginal persons and early settlers of North America used the lakes and rivers for transportation and communication. Water continued to play an important role for the provision and transportation of timber and natural resources (Conrad et al., 1993). To facilitate these needs and to keep trade away from the Americans, ambitious canals were built (Conrad et al., 1993). Not surprisingly, centres of commerce and trade arose along waterways. The water needs of these new centres were again met by increasing supply capabilities.

During the formative years of Canadian history it is important to note that much incidental legislation occurred which indicated the need for a broader approach to water resource management. Although the British North American Act of 1867 did not mention water, it did give legislative rights to the federal government. Pearse, Bertrand and MacLaren, (1985) indicate that incidental legislation in the areas of fisheries, navigation, agriculture, surveys, conservation and boundary waters was produced by the federal government which had impact on water resource management. It was at the Dominion-Provincial Conference on Reconstruction (1945) that the federal-provincial jurisdictional responsibilities for water were determined. It was also during this period, following World War II, that the development of natural resources intensified.

By the late 1960s and 1970s a new era of pervasive environmental concerns emerged and water management was to be profoundly and permanently affected (Pearse et al., 1985). Sessions (1995) suggests that the general movement of the time was in reaction to the increasing industrial/chemical pollution of the environment. The pollution issue drew attention to the Great Lakes where an International Joint Commission was formed to examine water quality. While some immediate attention was directed towards pollution, Quinn (1977) suggests that this period was characterized by a supply orientation and that "a philosophy prevailed that Canada was wealthy in water and that the main challenge lay in making it available for use by means of structures for storing and/or withdrawing it from Nature" (p. 231).

This was also a period where much discussion focused on the conundrum of water export (Foster and Sewell, 1981; Wilkinson, 1986; Scott et al., 1986). The greatest exportation proposal was the North American Water and Power Alliance scheme. Initially developed in 1963, a completed plan called for the diversion of a massive 308 cubic kilometres annually from Alaska and Canada to the western and southwestern parts of the United States (Foster and Sewell, 1981). In the United States much support is given to these proposals, especially as the need for water increases. In Canada, however, the dominant reaction has been one of

negative caution and disdain (Foster and Sewell, 1981). This reaction has come from the emotional feelings of heritage, a lack of knowledge about future needs, and the integral importance of water to the environment (Foster and Sewell, 1981; Scott et al., 1986).

Prior to 1970 the emphasis of the Canadian approach to water resources was on development (Mitchell and Shrubsole, 1994). Literature from this period began to acknowledge a shift from an approach based on development to an approach which recognized the complexity of water resource management, and the importance of the environment. For example, Kruger and Mitchell (1977) suggest that broader issues, including “the rate of population and economic growth, planned obsolescence in consumers’ goods, the ecological and social impacts of large dams, petroleum exploration, oil pipelines, highways and other public works, and aboriginal rights and land claims” (p. 4) were emphasized during the early 1970s. In response to public concern over the broader mandate of issues, the lack of foresight in early legislation to handle the increasingly complex water management issues, and the desirability of a joint federal-provincial approach to water resource management, the federal government undertook a series of organizational and legislative initiatives (Quinn, 1977). This led to the passing of the Canada Water Act in 1970 (Tinney and Van Loon, 1972; Quinn, 1977; Pentland, 1983; Mactavish, 1985). The Canada Water Act was an attempt to establish modern principles for the management of Canada’s water resources which were co-operative and more comprehensive (Tinney and Van Loon, 1972; Mactavish, 1985). The period from 1970-1987 was characterized by a more comprehensive approach to management. Discussion at this time focused on the shortcomings of a supply-based strategy. The traditional strategy of water management required rethinking due to: increasing developmental costs which were previously subsidized by the government, diminishing sources of water, pollution of water sources, the importance of water to the environment and the broadening diversity of values demanded for water resources (Goodman, 1984; Pearse et al., 1985; Tate, 1991).

The growing concern and awareness towards management of Canada’s water resources brought about a seminal event in Canadian water resource management history --

the formation of a national water policy. The process surrounding formation of a national water policy produced valuable literature with a broad scope. It provided a detailed look at past actions, past water policies, and provided an opportunity to describe water issues emerging in Canada (Pearse, Bertrand and MacLaren, 1984, 1985).

Stemming from the Canada Water Act, the Inquiry on Federal Water Policy was established in January 1984. The terms of reference asked the inquiry to “access the adequacy of federal water policy and the capacity of our institutions to respond to changing circumstance” (Pearse et al., 1985). The intensive and extensive inquiry culminated in the formation of a Federal Water Policy (1987) which is “... a statement of the federal government’s philosophy and goals for the nation’s freshwater resources, and of the proposed ways of achieving them” (Environment Canada, 1987, p. 3). The policy’s dual goals (to protect and enhance quality, and to promote wise use and management) were to be achieved by five outlined strategies of water pricing, science leadership, integrated planning, legislation and public awareness (Environment Canada, 1987). Formation of the Federal Water Policy was an important event as “virtually exclusive emphasis has been replaced by a much broader perspective which increasingly recognizes the role of managing water demands” (Kreutzwiser, 1991, p. 164).

Water management focused on demand has had a major place in Canadian Water Resource management literature. Tate (1991) in Water Demand Management in Canada: A State-of-the-Art Review professed that “water demand management is a strategy that encourages increasing flexibility in planning and decision making by taking systematic account of various socio-economic and political parameters, as well as more traditional physical factors” (p. 1). From the general strategy came the principles of demand management. These included: resource allocation mechanisms, expanding the range of alternatives, water conservation and encouraging sustainable development (Tate, 1991). Central to demand management is the idea of bringing demands into line with supplies by economic concepts such as pricing and charges (Pearse et al., 1985; Environment Canada, 1987; OECD, 1989;

Tate, 1991). Demand management also confirms the broader perspective to the traditional areas of engineering and economics, and consideration is now being given to non-traditional areas such as fish and wildlife, recreation, aesthetics, and historical/cultural values (Goodman, 1984; Tate, 1991). Demand management has been proposed as a complementary strategy to supply management as maximizing the efficiency and effectiveness of water supplies remains an important approach. After reviewing demand management, Tate (1991) concluded that the general strategy was in its infancy and needed to be coupled with existing approaches to improve the field of water resource management.

Concomitant to recognizing the desirability of demand management, recent international and national developments have propelled water resource management into a new era of sustainability. These developments have been well documented in the literature. In 1983, the World Commission on Environment and Development (the Brundtland Commission) was established by the United Nations to “re-examine the critical issues of environment and development and to formulate innovative, concrete and realistic proposals to deal with them” (1987, p. 3). The Brundtland Report generally concluded that the environment was a integral component that required immediate consideration if economic and social initiatives are to be sustained. Nations responded significantly to this international call for sustainable development. The Government of Canada undertook Round Table discussions to integrate environment and development and introduced the Green Plan (1990). Within the Green Plan the Government of Canada set a national objective to “secure for current and future generations a safe and healthy environment, and a sound and prosperous economy” (1990, p. 9). Central to the idea of a healthy environment is water.

In the era of sustainable resource management conventional challenges experienced in the development and management periods of water resources persist. Additional challenges have been the topic of much discussion. Currently, the ongoing population expansion has increased the demand for water, has increased the pollution of water, and has increased the amount of environmental degradation (Foster and Sewell, 1981; Pearse et al., 1984; World

Commission on Environment and Development [WCED], 1987; Postel, 1993; Bruce and Mitchell, 1995; Petts and Calow, 1996). In addition, both withdrawal and in-stream demands on water resources are increasing, are multi-objective, and are most often conflicting (Haith and Locucks, 1976; Foster and Sewell, 1981; Holy, 1982; Goodman, 1984; Pearse et al., 1984, 1985; Environment Canada, 1992; Bruce and Mitchell, 1995). Under the ethic of sustainable development thus far, water resource management research has concentrated on institutional arrangements, integration, interactions, ecosystems, and the full value of water.

Articles often compare water resource management between the United States and Canada. An examination of the history of water resource management Canada indicates that it closely mirrors the American pattern of preoccupation with specific projects; multiple use projects, non-structure measures and finally anticipatory measures (Kreutzwiser, 1991). Examples exist, however, that clearly show the advanced nature of Canada's southern neighbour. Throughout the history of the North American continent the United States has had a more detailed knowledge of future needs, methods, and applications (Foster and Sewell, 1981; Scott et al., 1986). The advanced nature may also be seen in specific innovative initiatives such as the Tennessee Valley Authority (Tate, 1981; Mitchell and Shrubsole, 1994).

While literature has indicated that Canadian water resource management may mirror that of United States; authors have also identified an important distinction, namely Canada's subscription to the myth of superabundance (Foster and Sewell, 1981; Bruce and Mitchell, 1995). Canadians perceive that the country has a limitless water supply which is suitable for all purposes (Bryan, 1972; Foster and Sewell, 1981; Rueggeberg and Thompson, 1984; Bruce and Mitchell, 1995). The perception that Canada's water supply is limitless is flawed, but this perception means that little attention has been given to water in Canada beyond a handful of specific studies, such as the work done by the International Joint Commission on the Great Lakes. Literature suggests that a valuable lesson could be gleaned from the energy crisis of 1970s (Foster and Sewell, 1981; Pearse et al., 1985). Both the previous energy crisis and the course of water management in Canada have tended to follow the issue-attention

cycle as described by Downs (1972). The five-stage cycle begins with the pre-problem stage in which only a few concerned individuals perceive the crisis. If these individuals persuade those in power of the importance of the crises it may become a political issue in the second stage of alarmed discovery and euphoric enthusiasm. Realizing the cost to make significant inroads follows and often results in superficial fixes. Eventually public interest declines and a post-problem stage is reached. The cycle eventually requires action when a crisis occurs. Canadian water management would appear to be following the issue-attention cycle.

Concern for Canadian water management has existed among some individuals for a long time. Most recently, political action has been spurred in response to international concern for the environment and the economy. Water resource management would appear to be in the third stage of the issue-attention cycle as public enthusiasm remains high and politicians have offered sustainable development as one way of problem solving. Justification for the proposed research lies herein. Because of this re-positioning it is necessary to examine the state of water resource management under the ethic of sustainable development to determine whether substantial inroads are being made towards sustainable water resource management, or whether the sustainability ethic is superficial rhetoric. If the former is true, Canada may be able to avoid experiencing a water crisis.

Federal Government Involvement

Water management in Canada occurs through various institutions. Similar to other federal countries, water resources in Canada are divided in terms of jurisdiction and responsibility. Much literature has been devoted to the role which the Government of Canada has had in the country's water resource management (Atlantic Development Board, 1969; Tinney and Van Loon, 1972; Austin, 1972; Quin, 1977; Foster and Sewell, 1981; Rueggeberg and Thompson, 1984; Mactavish, 1985; Kreutzwiser, 1991; Mitchell and Shrubsole, 1994; Bruce and Mitchell, 1995). As previously mentioned, the federal government's role in water management was first defined by the British North American Act of 1867. This formative legislation divided water management along property and legislative lines, thus provinces

own the water yet federal authorities may legislate over certain domains (Quinn, 1977; Pentland, 1983; Mactavish, 1985). As a result of this act, the Government of Canada maintained legislative rights over navigation, fisheries, international boundary waters and residual powers such as the right to legislate for “peace, order and good government” (Tinney and Van Loon, 1972; Percy, 1984; Mactavish, 1985; Kreutzwiser, 1991).

The Canada Water Act of 1970, provided the federal government with a framework for entering joint agreements with the provinces as well as with the ability to act unilaterally. The act attempted to establish modern principles for the management of Canada’s water resources which were co-operative and comprehensive (Tinney and Van Loon, 1972; Mactavish, 1985). As a result, four joint federal provincial studies were undertaken. These were conducted for the Qu’Appelle, Okanagan, Souris, and St. John River drainage basins (Tinney and Van Loon, 1972; Pentland, 1983; DePape, 1985). In 1981 Foster and Sewell commented on the federal and provincial interactions by stating that:

although these interactions are valuable, the present set of structures is clearly lacking in the type of institution that can carry out the hard bargaining necessary to establish national water priorities, overcome emerging problems and develop Canada-wide policies to manage the resource. (p. 88)

From these and other problems with the Canada Water Act, the Inquiry on Federal Water Policy was established to address the adequacy of the federal water policies during the 1980’s (Pearse et al., 1984, 1985; Mactavish, 1985; DePape, 1985; Robinson and Anderson, 1985). The federal water policy which was established in 1987 as a result of this inquiry reaffirmed the federal government’s jurisdictional responsibilities. In addition they took a lead role in defining the direction of water management in Canada. The initiatives taken by the federal government under the Canada Water Act prior to and after the Federal Water Policy are well documented in Annual Reports.

Most recently, “reaffirming the strategy and goals of the Federal Water Policy, The Green Plan sets out the Government’s contribution to further national co-operative efforts to protect and enhance Canada’s water resources” (Government of Canada, 1990, p. 34). Since

reaffirming their commitment to water resource management the federal government has, paradoxically, eliminated the Inland Water Directorate and its regional branches; the Interdepartmental Committee on Water has become inactive; the Federal Water Policy has lost momentum; funding for the Canada Water Act has been cut from \$5 million (1995) to \$500,000 in (1997-1998); and the Canadian Council of Ministers of the Environment terminated the Water Advisory Council (Bruce and Mitchell, 1995). While some of the inherent paradox may be attributed to the advent of a sustainable, ecosystem approach on the part of Environment Canada, a myriad of shortcomings are evident, such as a lack of sector strength which has prompted a water program review within Environment Canada to identify current responsibilities for water (Bruce and Mitchell, 1995).

New Brunswick Government Involvement

Given the divided jurisdiction of water resource management in Canada, much literature exists on the provincial water management jurisdiction (Atlantic Development Board, 1969; Quinn, 1977; Foster and Sewell, 1981; Rueggeberg and Thompson, 1984; DePape, 1985; Kreutzwiser, 1991; Mitchell and Shrubsole, 1994). As previously mentioned, ownership of water resources resides with the province. Precluding the inter-jurisdictional nature of water resource management, provinces may oversee development, sell, control flow and charge appropriately (Quinn, 1977; Rueggeberg and Thompson, 1984; Kreutzwiser, 1991).

The province of New Brunswick has an estimated 11,300 inland bodies of water and four major river drainage basins (Cardy, 1983; NBDOE, 1993). Prior to 1956 the responsibility of water management resided with the New Brunswick Department of Health. The Water Resources and Pollution Control Board was formed to study pollution, environmental protection; and to recommend ways the government should organize (Department of Municipal Affairs and Environment, 1988). The recommendations ultimately resulted in the passing of the Water Act in 1961 which made the New Brunswick Water Authority the sole agent responsible for provincial water resource management. Most of the authority's emphasis and hence the provincial focus, was on pollution and the St. John River (Fellows, 1969;

Cardy, 1983). The interest in the St. John river basin culminated in 1970 with Canada and New Brunswick signing the St. John River Basin Agreement which sought “to provide for optimum management of the water resources of the river basin for the social betterment and economic improvement of the region with due consideration to the maintenance of a proper ecological balance” (Cardy, 1983). The basin board produced, among other things, a comprehensive plan, and 30 specialist reports. The myriad of reports, along with the process’ framework may be the most valuable remnants from the basin board as the implementation of recommendations was problematic (Cardy, 1983; Tims, 1997; personal communication). It was also at this time that the Water Authority responsibilities were replaced by regulatory measures under the Clean Environment Act (Department of Municipal Affairs, 1988).

A provincial water management strategy began to develop during the 1980s. At the beginning of the decade W.F.G. Cardy, the past director of Environment New Brunswick’s Water Resources Branch, suggested that “a light but confident touch is seen as the key to gaining the greatest continuing benefits from our abundant water resource” (Cardy, 1983, p. 70). This initial strategy was refined in a discussion paper entitled -- Water Management Issues and A Clean Water Act. In the paper, it was recognized that: “the issue of water quality, particularly with reference to public water supply systems, is one of the most compelling and complex environmental management issues that the Government of New Brunswick must address in the late 1980s” (Department of Municipal Affairs and Environment, 1988, p. 12). The remainder of the document was devoted to developing a water management program under the legislation of the Clean Water Act.

The Clean Water Act was passed in 1989, and serves as a legislative framework for the province’s water management and demonstrates the commitment to water resources. Under the Clean Water Act (1989) section 40 (k), the Lieutenant-Governor may regulate the establishment of a water classification system. Although the discussion paper, Water Management Issues and A Clean Water Act, provided legislative context with general water management principles, the New Brunswick Department of the Environment focuses on the

protection of drinking supplies and the development of a classification process. The classification system is described as "... a method of planning and managing water quality and the competing uses of water" (NBDOE, 1993, p. 1). Much work has been completed towards the goal of a water classification system. When completed it will encompass biophysical inventories, public consultation and a systematic review process (NBDOE, 1992, 1993, 1995; Mitchell and Shrubsole, 1994).

The undertaking of a water classification system is a significant development as "at the present time in New Brunswick, water quality is managed by regulating discharge on a case by case basis, and issuing permits or approvals with conditions" (NBDOE, 1996, p. 1). While water classification is an improvement on existing water management, it is limited. Water classification sets management goals based solely on water quality. Water quality is but one of the many functions of water that require management. Supplying water of sufficient quality to meet demands, such as drinking water, recreation, and historical functions fails to provide ways to manage the multi-purpose demands being placed on resources.

Municipal and Community Involvement

Although municipal governments provide a third jurisdiction of water management which has focused on meeting water, wastewater and water treatment needs, literature suggests that the watershed or river drainage basin has provided the most appropriate form of water management (Pearse et al., 1985; Kreutzwiser, 1991; Mitchell and Shrubsole, 1992, 1994, 1997). Watershed-based structures may account for ecosystem complexities and provide an opportunity to link local planning with water management problems (Mitchell and Shrubsole, 1994, 1997). Most recently, the concept of a "nested" basin approach has been put forth as a systems approach to water management following natural boundaries. This new approach involves developing guidelines and frameworks for large interjurisdictional basins followed by developing ecosystem planning and management for smaller provincial and community-based basins (Bruce and Mithchell, 1995; Mitchell and Shrubsole, 1997). The watershed concept was first implemented in Canada by the province of Ontario. Since 1946, a total of

39 watershed-based conservation authorities have been established in this province (Pearse et al., 1985; Mitchell and Shrubsole, 1992). The watershed has also been the management unit for other endeavours, such as the federal-provincial Saint John basin studies. In addition to the watershed being an appropriate unit to manage a natural system, many Canadians see it “as an opportunity for dealing with water resources at a local level” (Pearse et al., 1985, p. 96).

A watershed management approach has not been widely accepted in New Brunswick. An examination of water resource management organizations in the province reveals that water management presently occurs in a fragmented and ad hoc manner through various departments. For example, the Department of Natural Resources and Energy, Department of Economic Development and Tourism, and New Brunswick Power all manage some function(s) of water. In addition, water management is not organized by geographic boundary. Most water management in New Brunswick is undertaken by local organizations at the community level and the boundaries vary among the organizations involved (J. Tims, personal communication, June 3, 1997). Two examples of community-based organizations in New Brunswick are the sites formed from the Atlantic Coastal Action Program and the New Brunswick Sustainable Development Program. These programs were described and evaluated in the context of coastal zone management by Glover (1996). Consequently, both programs were found to have particular strengths and weakness in terms of success with partnerships, public awareness, community support, sustainability and an integrated management approach (Glover, 1996).

These community-based approaches represent an opportunity for co-management of resources and are essential to a “nested” basin approach (Bruce and Mitchell, 1995; Mitchell, and Shrubsole, 1997; Mitchell, 1997). Co-management arrangements, in general, as described by Pinkerton “involve genuine power sharing between community-based managers and government agencies, so that each can check the potential excesses of the other (1993, p. 37). The community development approach to issues is generally well represented in the

literature (Warren, 1971; Wiledon, 1970; Mico, 1981; Christenson and Robinson, 1980; Dykeman, 1986; Lamoureux et al., 1989; Gunn and Gunn, 1991; Carley and Christie, 1993, Glover, 1996). These organizations are viewed as a way of bringing people together with common interests or concerns regarding an issue, problem or situation (Christenson and Robinson, 1980; Mico, 1981; Lamoureux et al., 1989). In addition, many benefits central to sustainable development may occur through these groups, such as public stewardship, forums, local level planning, active participation, increased understanding and initiating sustained change (Mico, 1981; Dykeman, 1986; Lamoureux et al., 1989; Gunn and Gunn, 1991; Carley and Christie, 1993, Glover 1996). Preconditions that appear to successful examples of resource co-management has been developed by Pinkerton (1989) and subsequently modified by Mitchell (1997). The most favourable preconditions include: the presence of a real or imagined crisis, willingness of the local users to contribute, formalized legal agreements, an opportunity for negotiation for co-management to perform a specific task, availability of external support and the relationships between people (Mitchell, 1997). Co-management, however, must be examined critically for rhetoric when preconditions and conditions are not met (Reed, 1995; Mitchell, 1997). Generally, the opportunity of co-management coincides with the local planning and management called for in a nested basin ecosystem approach which tries to marry centralized and local management systems.

In summary, water resource management in Canada is the responsibility of three jurisdictions; federal, provincial, and municipal, along with various non-governmental and community-based organizations. All institutions with an interest in water resources have gone through periods ranging from water development to water management. Currently they are entering a period of sustainable water resource management (Mitchell and Shrubsole, 1994). This study examines water resource management at the community level in New Brunswick for several reasons. First, these organizations appear to be dealing with a number of the critical issues facing water resources. Second, they provide the dominant means through which water resources in the province are managed. Third, community-based

organizations are ameliorated from the host of institutional complexities which may encumber other water resource management organizations (H. Collins, personal communication, January 28, 1997). Finally, these organizations embody the opportunity for the co-management of water resources and to the larger nested basin ecosystem approach. The following section elucidates the ethics, principles and approaches necessary for community-based organizations as they enter this new period of water resource management.

Emerging Paradigms

The spread of environmentalism and the resulting increased awareness of ecosystem linkages in the later half of this century led to calls for development and management that would be economically, socially and environmentally sustainable (WCED, 1987). The judgements required for sustainability are based on indices that qualitatively measure the degree of integration amongst the associated elements of resources (Mitchell, 1986; Lang, 1986; deGroot, 1992). This section describes the knowledge state pertaining to the ethic of sustainable development and the notion of integrated resource management as a strategy to ensure resource sustainability.

Sustainable Development

The General Assembly of the United Nations asked the World Commission on Environment Development to circumscribe “a global agenda for change” (WCED, 1987, IX). The message which emanated from this request was straightforward:

Humanity has the ability to make development sustainable -- to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs...sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are made consistent with future needs as well as present needs (WCED, 1987, p. 8-9).

This is not the first time that such a sentiment has been put forward. The notion of sustainability or wise use may be traced back to the start of the conservation movement and George Perkins Marsh (Sadder and Jacobs, 1990).

Many authors have viewed sustainable development as an ethic. Nelson and Eidsvik (1990) suggest that "the concept of [sustainable development] sets a very basic goal -- sustainability -- and provides a broad umbrella under which we can develop and perhaps agree upon various important principles and practices to be used in striving for the ideal -- which seemingly must be envisioned as a process rather than any utopian end state" (p. 66). This "process of change" is constituted by a plethora of topics, which include: economics, trade and fiscal policies, politics, agriculture, education, social equity, ecological integrity, population, industrial production and pollution (WCED, 1987; Khalid, 1989; Sadler and Jacob, 1990; Brown et al., 1991; Mitchell and Shrubsole 1994). Given the overarching nature of sustainable development, Dovers (1990) contends that there is an inherent amount of vagueness in the definition of sustainable development.

Other individuals have discussed the ethic of sustainable development in a critical manner. In addition to the concept's vagueness, the ethic has been identified as being too ambitious, and lacking operational measures (Sadler and Jacobs, 1990; Mitchell and Shrubsole, 1994; Worster, 1995; Mitchell, 1997). While these shortcomings may be overcome eventually, others have exercised caution. Most critically, Donald Worster (1995) has suggested that "... following the ambiguities, compromises, and smooth words of sustainable development may lead us into quick sand" (p. 426).

The Government of Canada explicitly has stated that "sustainable development is what we want to achieve. The Green Plan sets out how we are going to achieve it together in years to come" (Environment Canada, 1990, p. 5). Although the Green Plan was formed out of a nation-wide consultation process and accepts the need for change, it is fallacious to envision the Green Plan as a guide for how to achieve sustainability. The manner in which a sustainable development ethic should be observed is a formidable task and has been the focus of much literature.

Since the identification of sustainable development as a desirable goal, both international and national effort has concentrated on the formation of principles. Principle

formation is a logical first step because without these principles it is difficult to operationalize the ethic of sustainable development. Globally, the International Conference on Water and the Environment, held at Dublin, Ireland, in 1992 as a “lead in” to the Earth Summit in Rio, was “the most comprehensive water-oriented meeting since the United Nations Water Conference held in Mar del Plata, Argentina, during 1977” (Shrubsole and Mitchell, 1997, p. 5). The Dublin Statement, one of the main outputs from the conference, contains four guiding principles for water and sustainable development. The four guiding principles focused on: 1) a holistic approach to management, 2) a participatory approach to management, 3) the role of women and 4) managing water as an economic good (Shrubsole and Mitchell, 1997). Subsequently, a product of the Earth Summit, Agenda 21 also explicitly and implicitly makes reference to water (Shrubsole and Mitchell, 1997). At a national level, the Canadian Water Resources Association (1994), through a two-year consultation process, has developed sustainability principles for water management in Canada (Table 2.1). Shrubsole and Mitchell (1997) suggest that “in many ways they confirm the ideas in the Dublin Statement, as well as add some further matters for consideration” (p. 7). The national principles logically follow international efforts and form the first, necessary step toward the sustainable development and management of Canada’s water resources.

Developing indicators for the principles is a necessary second step to determine if a policy, practice and/or action is sustainable. The efforts of the Canadian Environmental Advisory Council (Ruitenbeek, 1991a; Ruitenbeek, 1991b) have provided reflection on the formation of indicators. The first step in the lengthy formation process has been completed. Preliminary indicators of sustainable development have been formulated in many sectors such as, forestry, tourism, mining, fisheries and water (Environment Canada, 1991). The approach of sector specific indicators, however, has been viewed as inadequate. Ruitenbeek (1991b) suggests that future indicators should: a) reflect a broader scope, b) reflect distributive elements important from a social equity perspective, c) be a projective tool, d) reflect explicit linkages between human economic behaviour and ecosystem productivity, and e) recognize

Table 2.1 Sustainability Principles for Water Management in Canada (adapted from Mitchell & Shrubsole, 1994)

<p style="text-align: center;"><u>Sustainability Ethic</u></p> <p>Wise management of water resources must be achieved by genuine commitment to:</p> <ul style="list-style-type: none"> - ecological integrity and biological diversity to ensure a healthy environment - a dynamic economy; and - social equity for present and future generations.
<p style="text-align: center;"><u>Water Management Principles</u></p> <p>Accepting this sustainability ethic, the CWRA will:</p> <ol style="list-style-type: none"> 1. Practice integrated resource management by: <ul style="list-style-type: none"> - linking water quality, quantity and the management of other resources; - recognizing hydrological, ecological, social and institution system; and - recognizing the importance of watershed and aquifer boundaries. 2. Encourage water conservation and the protection of water quality by: <ul style="list-style-type: none"> - recognize the value and limits of water resources, and the cost of providing it in adequate quantity and quality; - acknowledging its consumptive and non-consumptive values to both humans and other species; and - balancing education, market forces, and regulatory systems to promote choice and recognition of the responsibility of beneficiaries to pay for the use of the resource. 3. Resolve water management issues by: <ul style="list-style-type: none"> - employing planning, monitoring and research; - providing multi-disciplinary information for decision making; - encouraging active consultation and participation among all members of the public; - using negotiation and mediation to seek consensus; and - ensuring accountability through open communication, education and public access to information.

uncertainty in the behaviour and responses of ecosystems. Further, the use of physical indicators to meter sustainability has produced more questions regarding: the anthropocentric nature and knowledge requirements for sustainability, and the scope and time frame necessary for implementation (Dovers and Handmer, 1993; Carely and Christie, 1993; Worster, 1995; Mitchell, 1997).

Although many questions remain surrounding what sustainable development means in biophysical terms, literature is consolidated regarding the approach necessary for incorporating the sustainability ethic in the human dimension of the human-natural system relationship. Themes central to sustainability have focused on undertaking an ecosystem approach and reforming institutional arrangements.

An ecosystem approach is founded in system theory and explicitly acknowledges the inherently complex and dynamic reality of the natural environment. The fundamental importance of an ecosystem approach has been stressed in the literature (Savory, 1988; Robinson, Francis, Legge and Lerner, 1990; Mitchell, 1997; Mitchell and Shrubsole, 1997). A definition that is representative of this approach was developed by Grumbie: "ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over the long term" (1994, p. 31). Notwithstanding the complexities and uncertainties inherently in an ecosystem approach, the utility of the ecosystem as a natural spatial unit is well supported and essential to the nested basin approach to water management (Savory, 1988; Manning, 1992; Bruce and Mitchell, 1995; Mitchell, 1997; Mitchell and Shrubsole, 1997). Predicated on the acceptance of an ecosystem approach, Mitchell (1991) has suggested that three levels of integration reflect the breadth of the ecosystem approach. The three levels at which integration may occur are: in the processes of water, interaction between the hydrological cycle and human uses, and the union of resource and other development.

A second theme central to sustainable development has been the reform of institutional arrangements. Similar to the ecosystem approach the call for reforming institutions has been

pervasive under the sustainable development ethic (World Commission on Environment and Development, 1987; Robinson et. al., 1990; Carley and Christie, 1993; Shrubsole and Mitchell, 1994; 1997). This call has generally concentrated on shifting from bureaucratic compartmentalized institutions to institutions that are participatory, integrated, coordinated, and process focused (Mitchell, 1997). Specific focus has been given to the level at which sustainable development should be undertaken and the issue of empowerment through partnership and stakeholder involvement in the decision-making process.

Sustainable development guidelines have been put forth at international, national, provincial, municipal, and individual levels (WCED, 1987; Government of Canada, 1990; Premier's Round Table on Environment and Economy, 1990). While Simon (1989) has discussed a combined "top-down" and "bottom-up" approach, other authors such as the Canadian Round Tables (1993), Sellers (1995) and Naresh and Titi (1995) have emphasized the importance of a "bottom-up" approach and the value of community empowerment. It is difficult to argue with the importance of a "bottom-up" approach considering that:

It is at the community level that most is being done to protect the environment. We can all too easily get caught up in global negotiation whilst forgetting that people need to be free to pursue sustainable development for themselves. The reconciliation of environmental protection with economic advance essentially comes down to a mass of local problems (Carley and Christie, 1993, p. 206).

Solely recognizing the importance of capacity building through a community approach that focuses on a particular group of people in a defined area with common interests has been regarded as insufficient. In the context of Canadian water management, it is not clear whether decentralization has been an attempt towards an ecosystem, community-based approach or a way to reduce financial obligations (Bruce and Mitchell, 1995; Mitchell and Shrubsole, 1997). Under Agenda 21 the call for "subsidiarity" or decentralization of the decision making process represents an important issue to institutional reforms. The nature in which partnerships and stakeholder consultation is undertaken is key. A true partnership, as described by Kernaghan,

is one that “promotes empowerment in that they involve a sharing of decision-making power among partners” (1994, p. 61). In addition to interaction, input and participation from all stakeholders, the presence of an alternative resolution strategy is critical to planning and subsequently the commitment to action by participants (Mitchell, 1997). The fundamental nature of empowerment, capacity building and the incorporation of local knowledge are basic to the process of sustainable development (Manning, 1992; Carley and Christie, 1993; Mitchell and Shrubsole, 1997; Mitchell, 1997). Partnerships and co-management of resources represent examples of moving towards subsidiarity called for under sustainable development.

In sum, the ethic of sustainable development has gained wide acceptance. How the process of sustainable development is accomplished is presently the topic of much discussion, but the importance of a bottom-up, community-based approach is evident.

Integrated Resource Management

While sustainable development is heralded as a vision or goal for resource and environmental management, efforts continue in the development of means or strategies necessary to achieve sustainability. Under the ethic of sustainable development, integrated resource management has been rejuvenated, accepted, and given purpose as a means to achieve sustainability.

Given the centrality of integrated resource management to this proposal, it is critical to establish a clear understanding of the concept. A definition with considerable breadth is put forth by Loomis (1993) as “the process of organizing the different human uses of natural resources in such a way as to produce the greatest value of goods and services from those resources over a given period of time” (p. 8). A more specific definition was put forward by Mitchell. He states that “the usual idea associated with integrated resource management is the sharing and coordination of the values and inputs of a broad range of agencies, publics and other interests when conceiving, designing and implementing policies, programs or projects” (1986, p.13).

Significant literature has been devoted to detailing the constitutes of an integrated approach to management. (Mitchell, 1986; Lang, 1986; Armour, 1986; Priscoli and Homenuck, 1986; Shyberman, 1986; Sadler, 1986; Lang, 1986; Mitchell, 1987; OCED, 1989; Mitchell, 1990; Loomis, 1993; Mitchell, 1997). In particular, the work of Mitchell (1986, 1987, 1990) and Lang (1986) have been exemplary in providing the foundation for integrated resource management.

In these exemplary works, Mitchell (1986) and Lang (1986) have developed indicator components that make integrated resource management operational. Reliable symptoms offer further assistance to identify their presence. Mitchell suggests that the achievement of integrated resource management requires four interrelated components: "... multiplicity of means and strategies; blending of resource sectors; use of resource management as a mechanism for social and economic change; and striving for accommodation and compromise" (1986, p. 14). To these four criteria, Lang adds that integrated resource planning and management ought to be "... strategic, interactive and capable of accommodating multiple perspectives" (1986, p. 27). These seven components were used as indicators of integrated water resource management by Will (1993) in the water resource management realm and are described subsequently.

The idea of classifying resource management strategies by purpose, means, and participants originated from White (1969). From his framework five resource management strategies emerge. When considering the strategy type with the greatest breadth, the framework would suggest that "the ultimate target is to develop strategies in which multiple purposes are blended with multiple means and multiple participants" (Mitchell, 1986, p. 15). Measurable evidence that the organization exhibits consideration of diverse values and inputs of both agencies and private interests in a shared and coordinated manner are reliable symptoms (Mitchell, 1986).

Historically, management of natural resources has been organized in sectors which are the responsibility of different departments. While these focussed departments have the

advantage of specializing in particular problems, their narrow mandate and limited perspective precludes many other legitimate societal values and interests (Mitchell, 1989). From the literature pertaining to resource sector blending and interdisciplinary inquiry the importance of initiating, maintaining and mandating such an approach is evident. It also becomes clear that a balance must be struck which blends resource sectors while maintaining their individual strengths (Jantsch, 1972; Savory, 1988; Mitchell, 1989; Vining, 1990; Penning-Rowsell, 1993; Bruce and Mitchell, 1995). Undoubtedly this is a daunting task, yet theoretic and applied examples in the realm of water resource management provide models to build upon (Savory, 1988; Penning-Rowsell, 1993). The potential pitfalls of failing to maintain sectoral strength would indicate to the author that measurable evidence of an organization's consideration and balance of various resource sectors would be an appropriate indicator. Shared goals and objectives among these sectors are reliable symptoms.

A third indicator of integrated resource management is that resource management act as a mechanism for social and economic change. Mitchell (1986) warns of the danger in regarding resource management only as an ends rather than a means which may occur if goals are measured in physical terms, such as parts per million for water quality. Resource management's two-fold goal is to improve quality of life and maintain ecological integrity. The enhancement of positive social and economic change is a basic component of integrated resource management as "resources are viewed as but one of society's legitimate concerns, and as a tool to achieve broader and more fundamental societal goals" (Mitchell, 1986, p. 16). Measurable evidence is required that the organization exhibits the capacity to make decisions which are sensitive to social, economic, and environmental concerns. In this component "integration" occurs between resource management and other societal concerns. Quality of life and environmental integrity forethought are reliable symptoms.

Given the previous three basic components of integrated resource management which require the coming together of actors with a plethora of values, conflict and disagreements may be expected. Decisions by elected representatives are normally based on available

alternatives given by technical experts and affected interest groups (Mitchell, 1986). Mitchell writes that “it is this preceding level of planning and decision making that requires a mechanism for bargaining and negotiation so that the diverse values, perspectives and interests can be identified and considered” (1986, p. 17). Measurable evidence is necessary so that the organization exhibits the capacity to deal with conflict amongst these diverse viewpoints in planning. Processes and mechanisms which facilitate accommodation, compromise, negotiation and information sharing are reliable symptoms.

In addition to the four basic components previously discussed, measurable evidence that the organization exhibits the capacity for strategic planning is a fifth indicator of an integrated resource management approach. Strategic planning uniquely combines the strengths of comprehensive rationality with incrementalism and common sense (Lang, 1986). Reliable symptoms of a strategic approach are characterized by being: action oriented, focussed and focussing early, flexible and adaptive, and encouraging capacity building. In addition to following the components of conventional planning, strategic planning is proactive, oriented to organizational resources, cognizant of implementation capabilities, and supportive of intuition and judgement.

Measurable evidence that the organization exhibits a capacity for interaction is the second distinctive dimension of integrated resource planning and the sixth indicator of integrated resource management (Lang, 1986). Interaction is required for integrated resource management to occur due to a need for dispersed information, shared action space, conflict resolution, concern about legitimacy, and behavioural change. It is especially important that integration is ongoing throughout both the analysis and synthesis stages of planning to ensure that all diverse values and conflicts are identified. Mandating integration increases the diversity of values and, thereby, the amount of time, money and negotiation necessary for planning. Interaction may simultaneously aid planning efficiency by concomitantly bringing together various viewpoints and thus eliminating future standoffs. Reliable symptoms include active public participation, communication, and education throughout the entire process.

Measurable evidence that the organization exhibits the capacity to facilitate multiple perspectives is the final indicator of an integrated resource management approach. Lang (1986) suggests that “interperspectary” involves planners transcending individual perspectives, establishing inter-perspective respect and actively seeking out a number of perspectives. The perspectives, which are not mutually exclusive, should, ideally, act in a mutually supportive manner. Problems with this supportive ideal, such as professional pride and jealousy, are duly noted (Dejardins, 1981). Even though a multi-perspective approach may create barriers, multiple perspectives is an essential component of integrated management (Lang, 1986). The transcendence of individual perspectives and undertaking of “interperspectary” are reliable symptoms.

Many authors have made general reference to the importance of undertaking an integrated approach to management (Environment Canada, 1987; deLoe, 1990; Thornburn, 1990; Dorcey, 1990; Government of Canada, 1990; Dorcey, 1992; Cote, 1993; Kuffner, 1993; Penning-Rowell, 1993; Mitchell and Shrubsole, 1994). The Government of Canada’s Green Plan (1990) best captures the essence of this sentiment stating that: “In the past, responses to environmental problems paid very little attention to these important inter-relationships. Today, the increasing number and complexity of environmental issues demand that we adopt a more integrated approach” (p. 18). The importance of undertaking such an approach is paramount as water resource management literature has indicated integrated resource management as a strategy for directing efforts towards the goal of sustainable development (OECD, 1989; Penning-Rowell, 1993; Dorcey, 1992; Mitchell and Shrubsole, 1994).

Discussion has also appeared in the water resource management literature regarding examples or cases in which an integrated approach has been taken (Bangay, 1986; McPhee and Wiebe, 1986; Everitt et al., 1986; Jacob and Fenge, 1986; Charlton and Tufgar, 1991; McBean et al., 1992). These examples serve to reinforce the flexibility and situation specificity

necessary to achieve integration while reinforcing the universality of the approach's fundamentals.

In sum, the importance of integrated resource management has been emphasized as a means to achieve sustainable development. Although the definition maintains limited vagueness, indicators have been developed to make the concept operational.

Functions of the Natural Environment

Much of the integrated resource management and interdisciplinary literature has suggested the need for sectoral blending or broadening the values of water with which management is concerned (Holy, 1982; Mitchell, 1986; deGroot, 1992; Penning-Rowsell, 1993; Mitchell and Shrubsole, 1994, 1997; Bruce and Mitchell, 1995). In addition to the specific broadening of resource sector values, much has been written with regards to closing the social and natural sciences split and eliminating the economic value subjugation (Foster and Sewell, 1981; Vining, 1990; deGroot, 1992; Vaske, et al., 1995). These issues are pervasive and often concern the public. An individual participating in a workshop as part of the preparation for the document *Broadening Perspectives on Water Issues* (Bruce and Mitchell, 1995, p. 3) characterized such an approach as one,

... that may be embarking on a course that smacks of profound superficiality. 'Profound' in that it recognizes the importance of an ecosystem approach that emphasizes attention to the entire system and the linkages among its components, but 'superficial' in its lack of attention to water in all its dimensions -- human uses, as an economic driver, as an aquatic environment, as a key element of the national and global environment ...

Problems are exacerbated by the plethora of functions that water resources have -- recreational, aesthetic, transportation, consumption, production, energy, ecological, etc. (Holy, 1982; Goodman, 1984; Kreutzwiser, 1991; deGroot, 1992). From reviewing the aforementioned literature a problem becomes evident: water resource managers must account for or value all the functions of water.

To this end deGroot (1992) published an unprecedented work, entitled: *Functions of Nature: Evaluation of Nature in Environmental Planning, Management and Decision Making*.

The challenge of “trying to understand the multitude of functional interaction between man and the natural environment and integrating all these functions and associated values into a practical and universally applicable evaluation method is clearly quite complicated” (deGroot, 1992, p. XIV). Despite the infinite complexity of such a system, de Groot (1992) has put forth such a terrestrial based model.

deGroot’s (1992) analytical framework is based on the concept of environmental functions. Environmental functions are defined as “the capacity of natural processes and components to provide goods and services to satisfy human needs (directly and indirectly)” (deGroot, 1992, p. 7). The analytical framework contains four functional categories -- regulation, carrier, production and information. Each category is comprehensively delimited. According to deGroot (1992) the regulation function is concerned with essential life processes which ensure a healthy environment and supplies clean air, water and soil; the carrier function category encompasses the environmental provision of space and suitable medium for human activities such as recreation; the production function provides a diversity of resources from power to food; and the information function contributes to mental health by providing a myriad of opportunities ranging from spiritual reflection to aesthetic value. In his analytical framework, deGroot (1992) further subdivides the four main categories into 37 separate functions that can be applied to the ‘total’ natural environment. Ultimately, a checklist of appropriate parameters (functions) can be designed for a particular natural area.

The literature suggests that water resources provide many functions and values which fall in sub-division under the four main function categories which deGroot (1992) put forth. The combination of deGroot’s (1992) ‘total’ environment analytical framework with the ‘functions’ and values put forth by selected water resource literature as they pertain to the context of this proposal may be seen in Table 2.2.

Table 2. 2 Functions of Water

Function Type	Function	Reference
Regulation Functions	Water Quality	deGroot, 1992; Goodman, 1984; Government of Canada, 1990
	Water Reservoir/Availability	deGroot, 1992; Foster, & Sewell, 1981; Bruce, & Mitchell, 1995
	Storage and Recycling of Organic Wastes	deGroot, 1992; Goodman, 1984; Pearse, Bertrand, & MacLaren, 1985
	Storage and Recycling of Human Wastes	deGroot, 1992; Goodman, 1984; Pearse, Bertrand, & MacLaren, 1985
	Maintenance of Biological Diversity	deGroot, 1992; Bruce, & Mitchell, 1995
	Nursery and Migration Habitat	deGroot, 1992; Pearse, Bertrand, & MacLaren, 1985; Government of Canada, 1990
Carrier Functions	Recreation & Tourism	deGroot, 1992; Environment Canada, 1987; Goodman, 1984; Government of Canada, 1990
	Nature Protection	deGroot, 1992
	Aquaculture	deGroot, 1992; Government of Canada, 1990
Production Functions	Food & Nutrients	deGroot, 1992; Goodman, 1984; Government of Canada, 1990
	Energy	deGroot, 1992; OCED, 1989; Bruce, & Mitchell, 1995; Government of Canada, 1990
	Drinking Water	deGroot, 1992; OCED, 1989; Government of Canada, 1990
	Manufacturing	Bruce, & Mitchell, 1995; Pearse, Bertrand, & MacLaren, 1985
Information Functions	Aesthetic Information	deGroot, 1992; de Donnea, 1982; Goodman, 1984
	Spiritual/Historic Information	deGroot, 1992; Goodman, 1984
	Cultural/Artistic Inspirations	deGroot, 1992; de Donnea, 1992; Bruce, & Mitchell, 1995
	Education & Scientific Information	deGroot, 1992; Goodman, 1984; Government of Canada, 1990

Emerging Paradigms and Canadian Water Resource Management

The above sections clearly indicate the desirability of sustainable development, the importance of developing sustainability principals, and the requirements of forming indicators. Synthesis of the emerging paradigms are capsulated in Table 2.3. The ethic of sustainability has been established in the literature as the overarching goal of water resource management (WCED, 1987; Government of Canada, 1990 Bajard, 1990; Dorcey, 1992; Smith, 1993; Mitchell and Shrubsole, 1994, 1997). More specifically, under the ethic of sustainable development the Canadian Water Resources Association is committed to principles of integrated resource management, water conservation and quality, and issue resolution (Table 2.1). Upon inspection these principles mirror those of Mitchell (1986), deGroot (1992), and Lang (1986). The latter, however, may be used as operational measures or indicators for the aforementioned principles.

Table 2.3 Synthesis of Emerging Paradigms

Sustainability Ethic	Sustainable Water Management Principles	Indices of Integration
	1. Resource Management Components	1. Multiple-Purpose, Means & Participants 2. Sector Blending 3. Soci-Economic Tool 4. Conflict Resolution
	2. Resource Values	1. Production Functions 2. Carrier Functions 3. Information Functions 4. Regulatory Functions
	3. Resource Management Strategies	1. Strategic 2. Interaction 3. Multiple Perspectives

In summary, the literature examined throughout this chapter would indicate two knowledge voids in the realm of water resource management which this research seeks to fill. First, a general description of the contribution community-based organizations make to water management in the province of New Brunswick, Canada is wanting. Second, a knowledge void is evident between emerging paradigms and current practice. The next chapter discusses how the proposed research seeks to fill these voids.

CHAPTER THREE

METHODOLOGY

Introduction

The research methodology is presented in two sections. The first section, research foundations, concentrates on the rationale, underpinnings and theoretical issues central to this undertaking. The remainder of the chapter, research design, is devoted to detailing the approach followed in this query.

Research Foundations

Research methods literature indicates that research design should depend on: 1) the purpose of the study, 2) the nature of the study, and 3) the alternative approaches that exist (Issac and Michael, 1979; Yin, 1994; Thomas and Nelson, 1996).

The purpose and nature of the study, presented in Chapter One, suggest that the proposed research falls within the descriptive and case/field design categories. Research methods literature denotes that alternative research strategies exist for these categories, such as; questionnaires, interviews, surveys and case studies (Isaac and Nelson, 1979; Thomas and Nelson, 1996). The strengths and weaknesses of each approach as they relate to the this research are shown in Table 3.1.

Various authors have described the case study research design as a multifaceted, in-depth investigation of a contemporary phenomena (Isaac and Michael, 1979; Orum et al., 1991; Neuman, 1994; Yin, 1994; Thomas and Nelson, 1996). The case study method was well suited to conducting the proposed research for four reasons. First, literature presents the case study as useful when investigating a complex phenomena with many variables in which the context is important or possibly indistinguishable (Orum et al., 1991; Neuman, 1994; Yin, 1994). Second, the case study method is an all-encompassing approach. Included

Table 3.1 Research Methodology (adapted from Issac and Micheal, 1979; Orum, Feagan and Sjoberg, 1991; Newman, 1994; Yin 1994; Thomas and Nelson, 1996)

Method	Strength	Weakness
Questionnaire: a type of survey in which individuals respond to written questions	<ul style="list-style-type: none"> - anonymity - large number of returns - economical 	<ul style="list-style-type: none"> - uniform responses - low response rate - limited length - limited number of variables - bias with reading skill
Interviews: a survey technique which individuals are verbally asked questions	<ul style="list-style-type: none"> - greater depth - probing for information - establish rapport - ask complex questions 	<ul style="list-style-type: none"> - costly - retrospect nature - limited amount of variables - social desirability bias - interviewer bias
Case Study: in-depth multifaceted investigation of contemporary phenomenon	<ul style="list-style-type: none"> - multiple modes of inquiry - studies units in natural environment - large amount of information - flexible 	<ul style="list-style-type: none"> - time - cost

in the research design may be alternative methods, such as the interview, direct observation, and the questionnaire. Multiple sources of evidence can be examined and resulting information should act in a triangulating fashion (Orum et al., 1991; Yin, 1994; Thomas and Nelson, 1996). Third, the use of theory in study guidance and generalization is characteristic of the case study method (Orum et al., 1991; Yin, 1994). Finally, examples exist in the literature that show the method being appropriate for the study of organizations (Sjoberg, Williams, Vaughan and Sjoberg, 1991; Yin, 1994; Thomas and Nelson, 1996). In fact, the case approach is prominent in resource management literature (Faulkner, 1986; Bangay, 1986; Charlton and Tufgar, 1991; McBean, Mereu, Garthshore, Kitchen and Benson, 1992). Two examples are illustrative. The Organization for Economic Co-operation and Development (1989) used a case study method for 106 cases in the evaluation of integration in water policies with respect to other government policies and deGroot (1992) conducted three case studies concerning the functions of nature.

After considering the criteria necessary to choose a research design, the special characteristics of a case study approach, and examining examples that have used a similar research design, the case study appeared to be a method well suited to the study. The remainder of this chapter is devoted to the details of this research technique.

Research Design

Case Study Design

Research design for the case study, similar to other research strategies, is an outline containing the way in which data were collected, treated and, ultimately, address the postulated questions. The case study, however, is unique because unlike many other research methods, comprehensive design literature does not exist (Orum et al., 1991; Yin, 1994; Thomas and Nelson, 1996). Authors of general research method literature often suggest that Yin (1994) has set the precedent for the case study method (Sjoberg et al., 1991; Neuman, 1994; Thomas and Nelson, 1996). The following design is based on Yin's case study method (Figure 3.1)

Figure 3.1 Case Study Method (Yin, 1994)

and follows his suggestion that a multiple-case design, as opposed to a single case, is desirable due to increased robustness, replication logic and relation to questions. The multiple-case design also permits the selection of cases that predict similar results which is literal replication, or produces contrasting results for predictable reasons which is theoretical replication.

The first of the subsequent sections discuss the concept of theory as a pervasive idea to the case study approach. Next, the study's questions, propositions and unit(s) of analysis are presented. Then, the manner in which data are linked to the propositions and the criteria for interpretation of the results are discussed. Nested within the proceeding section is the data collection protocol which includes case selection, case study protocol and cross case data analysis. The chapter concludes by addressing the generalizability, reliability and validity of the study.

Theory

As with all research, theory plays a crucial role in case study research (Mitchell, 1989; Neuman, 1993; Yin, 1994). Although the role of theory in research has been poorly articulated in the realm of resource management, a theory is generally considered "a plausible statement accounting for the relationship between two or more phenomena" (Mitchell, 1989, p. 23). It is generally agreed that a theory's primary purpose is to explain, and subsequently predict (Mitchell, 1989; Neuman, 1994). Theory development in case study research design is essential for two reasons. First, important components of case studies stem from theory. These include a study's questions, propositions, units of analysis and the logical linking of data to propositions (Yin, 1994). Second, theory serves as the level of generalizability of the case study results. As the research represents the first attempt, to the author's knowledge, to describe and analyse the contribution of community-based organizations to the sustainable development of water resources in New Brunswick, no known previous theories exist. To overcome this problem, the rational and direction for this inquiry comes from the emerging paradigms in the water resource management realm.

Study Questions

This study sought to answer the following three questions:

Research question one: Do the community-based organizations in New Brunswick manage water resources relative to integrated resource management components?

Research question two: Do community-based organizations in New Brunswick consider the full range of resource values?

Research question three: Do the community-based organizations in New Brunswick undertake integrated resource management strategies when managing water resources?

Research Propositions

Generally, the study maintains the proposition that to meet and manage the current water resource situation in New Brunswick, the ethic of sustainable development as an overarching goal is required. The research propositions stem from the research questions and focus on: resource management components, resource values and resource management strategies.

Proposition One: To achieve sustainable development, an integrated approach to management is necessary. This approach involves four main components of: multiple purposes, multiple means, multiple participant strategies; blending of various resource sectors; management as a mechanism for social and economic change; and, presence of mechanisms for accommodation and compromise.

Proposition Two: To meet the multi-objective demands which are being placed on water, resource managers require objective evaluation criteria, or the consideration of all functions of water for the specified environment (deGroot, 1992).

Proposition Three: To meet the current challenges of water resource management and the ethic of sustainable development water resource management must be integrated. Integrated resource management, by necessity, must involve: strategic planning, interactive planning, and must take a multiple perspective approach (Lang 1986).

Unit of Analysis

The unit of analysis in case study research defines the actual case and stems from the research questions. From the initial research questions, the community-based water resource management organization is the unit of analysis. Through background research it is apparent that no uniform water resources management organizations exist in the Province of New Brunswick. Therefore, the unit of analysis was entities which have a mandate primarily concerned with water management in the province of New Brunswick and meet specific criteria that are outlined in the delimitation portion of this document.

Case Selection

Due to the lack of uniformity among water management organizations in the province of New Brunswick, the following criteria were developed to aid in case inclusion. Firstly, the organization's principal interest and or area of concern had to be aquatic with a geophysical unit of a watershed, basin or sub-drainage basin. Secondly, the organization must have existed in its current manner for a minimum of one year. Thirdly, the organization had to purport to being community-based. Finally, the organizations had to be geographically distributed throughout the province. The province was divided into five main drainage areas as representatively shown in Figure 3.2. In addition to the type of cases selected, the number of cases is an important consideration because it is akin to setting a confidence level for the study.

Unlike experimental sampling frames, sample size in case studies is irrelevant and the number of cases to include is determined by the number of replications (Yin, 1994). Choosing a number of replications is similar to setting confidence levels based on the degree of certainty desired. Yin (1994) suggests that "... if you want a high degree of certainty, you may press for five, six or more replications" (p. 50). Five cases were deemed a reasonable number for two additional reasons. First, a total of twelve organizations in the province were identified which met the aforementioned criteria. Second, the organizations were representative of the five drainage basins. Subsequently, organizations that met the aforementioned criteria were

compiled for each of the drainage areas. Within these, the longest established organization was contacted first because longevity was believed to be a precursor of experience and potential development. Willingness to participate in the study was the final criteria to case inclusion. Within the cases it is important to consider both literal and theoretical replication. Literal replication (obtaining similar results) was emphasized given the explanation-building emphasis of this research. Through the case selection process the five organizations selected were: The Miramichi River Environmental Assessment Committee, The Bathurst Sustainable Development Project, The Trout Creek Model Watershed Committee, Eastern Charlotte Waterways, and The St. John River Society. The location of each organization's office is representatively shown in Figure 3.2.

Case Study Protocol

Five steps constituted the case study protocol. In addition, the three guiding principles for high-quality case studies, as proposed by Yin (1994), were followed. The first principle dealt with multiple sources of information and emphasizes the method of triangulation. The second principle addressed the formation of a data base which is separate from the formal case study report. The final principle dealt with the establishment of a chain of evidence. The three principles are reflected in the protocol but, are explained further in this chapter under the headings of reliability and validity.

Step One

The first step in the case study protocol was to contact the potential case organizations and obtain consent. Initial contact was made via telephone. At this time the executive director of the community-based organization was told of the research's purpose. Upon indicating an interest in participating, a visit was paid to the executive director and informed consent was gained.

Step Two

The second step in the research protocol involved development of a conceptual framework. Literature indicates that examples exist where organizational elements and

Figure 3.2 Drainage Basin Areas and Case Locations in New Brunswick

indicators of integration have been combined in a meaningful way. Analytic frameworks have been developed by Needham (1993) and Will (1993) which marry the basic elements of the Natural Resource Management Assessment Model to the components and indicators of integrated resource management. Adding the established resource value component (deGroot, 1992) to the previous frameworks yielded a conceptual framework that captures the spirit of the Canadian Water Resource Association's principles of sustainability (Table 2.1).

The framework developed for this study was subjected to a pre-test using a community-based water management organization in New Brunswick. Both the Executive Director of the organization and the researcher approached the framework from a technical and theoretical perspective. From this critical review necessary adjustments were built into the final theoretical template (Table 3.2). This template consists of two dimensions and was used to guide the research effort.

The first dimension involved the examination of specific management ingredients. Literature suggests that authors conducting studies in the realm of natural resource management with a focus on institutional and/or organizational arrangements have utilized The Resource Management Assessment Model (Mitchell, 1987; Mitchell and Pigram, 1989; Needham and Jedyneck-Copley, 1989; Will, 1993; Stacey, 1995). The model extends and clarifies traditional management components of planning, organizing, controlling and directing, with terms that are more suited to management system examination. The model provided a checklist of key elements which directed the researcher's exploration and examination. The model consists of five elements: background and legitimization; roles and responsibilities; structure; processes and mechanisms; and organizational culture (Table 3.3). Each element may be further broken down to illustrate possible sub-elements.

Within these, background and legitimization refers to: the general situation surrounding the organization under investigation, the organization's reason for existing and includes the establishment of management goals and objectives based on analysis and option evaluation, other pertinent agencies objectives, and the scope of rules and authorities of the organization.

Table 3.2 Theoretical Template of Managerial Elements and Indices of Integration

INDICES OF INTEGRATION		MANAGERIAL ELEMENTS				
		Background & Legitimization legal and non-legal standing	Roles & Responsibilities stakeholder participation	Structure institutional arrangements	Processes & Mechanisms ways and means to facilitate decision-making	Organizational Culture stakeholder perception, attitudes and values
COMPONENTS	MPMMMPS multiple-purpose multiple-means multiple-participants					
	Resource Sector Blending balance, breadth and depth					
	Social and Economic Change sensitivity to social, economic and environmental consequences					
	Accommodation and Problem Solving compromise consensus building mediation negotiation information sharing					
STRATEGIES	Strategic action oriented focused early capacity building intuition and judgement based					
	Interactive open participation stakeholder consultation balance and agreement consensus building					
	Multiple Perspectives technical organizational political personal					
VALUES	Regulation Functions water quality, water reservoir/availability, storage and recycling of organic wastes, storage and recycling of human waste, maintenance of biological diversity, nursery and migration habitat					
	Carrier Functions recreation & tourism nature protection aquaculture					
	Production Functions food & nutrients energy drinking water manufacturing					
	Information Functions aesthetic information spiritual/historic information cultural/artistic inspirations educational and scientific information					

Table 3.3 Elements of the Resource Management Assessment Model
(adapted from Mitchell, 1987; Needham, 1993; Stacey, 1995)

Element	Considerations (sub-elements)
Background and Legitimization	<p>past and present conditions in which an organization is rooted</p> <p>credibility regarding objectives, responsibilities and authority</p> <p>legal and non-legal status and authority of an organization</p>
Roles and Responsibilities	<p>stakeholder participation and assigned or assumed tasks</p>
Structures	<p>internal and external organizational arrangements that support administrative, operational and other responsibilities</p>
Processes and Mechanisms	<p>tools and procedures to facilitate stakeholder participation in organizational affairs</p>
Organizational Culture	<p>stakeholder perceptions, attitudes and values in relation to organization affairs and decision-making</p>

Sub-components include the state of the natural environment, legal and financial arrangements, and the general decision-making milieu (Mitchell, 1987; Stacey, 1995). Roles and responsibilities refers to the organization's purpose in relation to government agencies and other organizations. The structure component denotes the adequacy and use of the organization's structure to meet its needs, purpose and capacity. The fourth component, processes and mechanisms, refers to the ways and means that the organization uses throughout management stages, such as, planning, controlling, implementing and monitoring. Organizational culture is the final component and is concerned with the people within the entity. Sub-components include aspects such as organization values, co-operation and goodwill.

The second dimension of the framework is an elaboration of the operational measures or indicators of the sustainability principles for water management in Canada as discussed in Chapter 2 (Table 2.3). These indicators focus on resource components (Mitchell, 1986), resource values (deGroot, 1992), and resource strategies (Lang, 1986). They are: multiplicity of means, purposes and participants; blending of resource sectors; use of resource management as a mechanism for social and economic change; striving for accommodation and compromise; regulation, carrier, production and information functions; strategic and interactive planning; and capability of accommodating multiple perspectives.

The theoretical template is crucial because it linked the study's research questions and propositions to data collection and analysis. In data collection and analysis the template acted as a checklist to ensure that the five managerial elements and indices of integration receive attention. The template was also important for cross-case consistency and second level analytic generalization, which will be discussed later in the chapter.

Step Three – Field Research Procedures.

For this study, three complementary sources of evidence were used -- documentation, interviews, and direct observations. The following section presents the relative complementary

(triangulating) nature of the three sources of evidence and explains the methodology followed in data collection for each.

Document analysis has been described by Thomas and Nelson (1996) as a “type of descriptive research directed primarily at establishing the status of certain practices; areas of interest; and the prevalence of certain errors, usage of terms, and space counts” (p. 20). Document analysis plays two important roles in case studies. Yin notes that “first, documents are helpful in verifying the correct spellings and titles or names of organizations that might have been mentioned in an interview. Second, documents can provide other specific details to collaborate information from different sources” (1994, p. 81). Used in this manner, document analysis either enforced other sources of evidence which indicated finding convergence to the researcher or indicated discrepancies among the multiple sources of evidence, and thus the investigator undertook a new line of inquiry.

Document analysis was flexible, yet occurred in a systematic fashion. Time was allotted during site visitations to conduct document retrieval in two specific ways. First, a request was made to the organization for access to pertinent documentation such as, minutes of meetings, action plans, and master plans. Secondly, the local collections of archive or library information were searched. Approximately five documents were gathered for each case. Once a copy of documentation had been obtained, analysis was guided by the theoretical template (Table 3.2). Hence, findings from the document analysis were then compared to other sources of evidence to establish congruence of findings. If congruence is was not established a new line of inquiry was initiated to identify evidence discrepancies.

Interviews are the second source of evidence. The importance of the interview has been definitively stated by Yin (1994) as “interviews are an essential source of case study evidence because most case studies are about human affairs”(p. 85). A semi-structured interview format was used as the principal method of data collection. The open-ended interview format is advantageous because insights as well as opinions may be obtained (Neuman, 1994). Attainment of the aforementioned contributes to the distinction between a

respondent and an informant. The latter was crucial because “such persons 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, p. 84). Semi-structured interviews of an in-depth nature were conducted with each organization’s executive director, coordinator or president. The in-depth nature of these interviews was due to the individual’s role as an informant. The interview was given structure from the theoretical template (Table 3.2). The managerial elements and indices of integration guided the investigator’s line of inquiry and subsequent probing. All interviews were recorded and placed in the case data base.

Semi-structured interviews were also conducted with a founding member of each organization and one other member. The purpose of conducting these interviews was to collaborate facts and insights found through the previous data collection procedures. Questions were asked in such a manner that respondents were unaware of the investigator’s attempt to formulate convergence (Yin, 1994). The investigator took note of the respondents answers to each of the questions posed and compared them to the informant’s insights and documentation. Convergence occurred from conducting two additional interviews for all organizations.

The third source of evidence was direct observation. Since the case is a contemporary phenomena the opportunity for direct observation by the investigator is present. The role of direct observation in this protocol is two-fold. First, data gathered through direct observation should have a collaboratory role with other sources of evidence (Yin, 1994). Second, direct observation provided the investigator with invaluable case background and additional case information. Due to the collaboratory nature of direct observations, guidelines for data collection were followed as opposed to observing formal protocol.

When undertaking direct observation the following guidelines were observed. First, the investigator made direct observations which pertain to the theoretical template (Table 3.2). Secondly, direct observations were made in general with consideration to additional

and background information of the case. Direct observations occurred at least on two occasions. The first was during visits to the organization's location. The second occurred at the organization's meetings and/or functions. The principal investigator attended at least one of each organization's meetings. Field notes were taken by the investigator during the observations.

Step Four

The fourth step was one of compilation and organization. Yin (1994) notes that "the lack of a formal database for most case study efforts is a major shortcoming of case study research and needs to be corrected in the future" (p. 95). The formation of a case data base was the fourth step in the protocol. All sources of evidence gathered throughout the aforementioned data collection techniques constitute the data base. This includes all available documentation, audio tapes, field notes, photographs etc. The importance of database formation has much to do with reliability issues which is discussed later in the chapter.

Step Five

Analysing the evidence

Outlining a strategy of data analysis in the case study protocol is extremely important and is "especially difficult because the strategies and techniques have not been well defined in the past" (Yin, 1994, p. 103). This case analysis was guided by the two dimensions of the theoretical template (Table 3.2). The first dimension involves the elements of resource management systems. The second dimension involves the indicators of integration.

Mode of analysis

The goal of the analysis was to gauge integration in each organization and to ultimately address the questions and propositions put forth at the outset of this research. The dominant mode of analysis for the case was pattern matching. Pattern-matching logic as an analysis strategy was desirable for two reasons. First, it is an accepted method of analysis in case study research (Yin, 1994, p. 106). Second, the use of a matrix of indicators to evaluate

components follows in a tradition of previous studies (Landers and Knuth, 1991; Downs, Gregory and Brookes, 1992; Will, 1993; Torrible, 1994; Stacey, 1995).

The pattern matching mode of analysis used in this research involved three stages and follows the conceptual framework generated previously in this chapter. The first stage, rooted in the literature review, was the compilation of criteria which are symptomatic of integration. These are the indices for integration as articulated by Mitchell (1986), Lang (1986), and deGroot (1992). Further, these criteria were used as a consolidation of antecedent viewpoints by Will (1993) to qualitatively measure the degree of integration in institutional arrangements. In the second stage, the results for each case were analysed through examining the managerial elements for the presence of characteristics symptomatic of integration as outlined in the first stage. Building upon knowledge gained in the second stage, the third stage of analysis involved the development of a profile of exhibited characteristics that are symptomatic of integration. In the profile, the intensity with which the organization exhibited the characteristic is gauged at three levels using a relative scale. The first level, represented by the symbol (-), indicates that the presence of the characteristic was weakly exhibited. The second level, represented by the symbol (•), indicates that the characteristic was moderately exhibited. The third level, represented by the symbol (+), indicates that the characteristic is strongly exhibited. The difference between moderately and strongly exhibiting the characteristics depended on the consideration given to the key aspects of each criteria. For example, within the resource sector blending criteria, the characteristic was considered moderately exhibited if, within the particular managerial element, resource sector blending was either initiated, maintained or mandated. To be strongly exhibited, under the same managerial element, the organization would have to initiate, maintain and mandate resource sector blending. Since the framework may be broken down to correspond with the propositions posed at the onset of this research, the intensity with which characteristics were exhibited are directly related to the potential for integration in each case. Strongly exhibited characteristics confirm the presence of integration and consolidate the propositions which provide foundation

to this research. Moderate or weakly exhibited characteristics indicated barriers to integration and ultimately shortcomings to the potential of each organization to sustainably manage the water resources of the province.

Step Six

The formal writing of each case, Chapter Four, constituted the sixth and final step in the case study protocol. Each case report was written following the three sustainable water management principles which guided the study (Table 2.3). Prior to evidence analysis, Chapter Five, the case description, was given to the case informant to read. This procedure is aimed at ensuring accuracy and increasing reliability.

Cross-Case Data Analysis

Cross-case data analysis, a key feature of the multiple case study design, occurred through two modes. The modes are pattern matching and explanation building.

Pattern Matching

Similar to the mode of data analysis used in each case, simple pattern matching was also employed at the cross-case level. The patterns from each case were compared to subsequent cases. Yin states that if an “identical result were obtained over multiple cases, literal replication of the single cases would have been accomplished, and the cross-case results might be stated even more assertively” (p. 109). Three stages were employed in the cross case analysis. The first stage utilized the criteria symptomatic of integration previously identified. The second stage synthesized the results for all cases through examining the managerial elements for the presence of characteristics symptomatic of integration. The third stage involved inspecting the synthesis profile for similarities and differences in characteristics exhibited by the cases. If four or more cases exhibited characteristics symptomatic of integration at the same intensity it would indicate considerable cross-case consistency. For example, if all five organizations exhibited characteristics that matched the reliable symptoms of the “interactive” indicator with a strong (+) intensity, it would suggest that the community-based water management organizations in New Brunswick collectively

exhibit the characteristic of interaction at a strong intensity within the principle area of strategies.

Explanation Building

A second analytic strategy undertaken at the cross-case level was that of explanation building. Explanation building occurred through performing a set of cross-case procedures as proposed by Yin (1994). First, a set of propositions were put forth as previously described in this chapter. The propositions were made operational through the theoretical template (Table 3.2). The initial case is then compared to the first set of propositions using simple pattern matching. Propositions were then modified based on discrepancies found in the simple pattern matching mode of data analysis and applied to subsequent cases. If cross-case consistency was established for all characteristics within a principle areas, an explanation may be formulated. Iterations continued although discrepancies were not minimized.

Generalizability of the Findings

The importance of theory cannot be stressed sufficiently in the case study method, and it is the theoretical level to which the case study was subsequently generalized (Orum et al., 1991; Yin, 1994). This analytic generalization is distinct from the more familiar statistical generalization and requires explanation. Yin explains that, “in statistical generalization, an inference is made about a population (or universe) on the basis of empirical data collected about a sample” (1994, p. 30). Conversely, the case study generalizes through analytic generalization, “in which a previously developed theory is used as a template with which to compare the empirical result of the case study” (Yin, 1994, p. 31). The difference between level one, statistical generalization and level two, analytical generalization may be graphically illustrated in Figure 3.3. Therefore, the findings of this study were generalized at the theoretical level. More specifically, generalization occurred to the principles of sustainability for water management in Canada and the state of water management in the province of New Brunswick.

Figure 3.3 Making Inferences: Two Levels (Yin, 1994)

Validity

As with all research the issue of validity was important to the case study. The issues of construct validity and external validity have been considered as suggested by Yin (1994). To ensure construct validity and to minimize the chance of subjectivity, the research used multiple sources of evidence from which convergence is sought. In addition, a chain of evidence was established by conducting interviews from multiple individuals. A final effort to increase construct validity was to have the organization informant read the draft case report.

External validity is concerned with the ability to generalize the results. The multiple case design of the study was intended to increase the external validity of the results. The replication logic (literal and theoretical) implemented in various stages of the protocol produced confidence with which analytical generalization may take place.

Reliability

One trait of quality research or “good science” is that the results are repeatable. Much emphasis was placed on minimizing researcher bias (Yin 1994). Two steps were taken in the proposed research to increase the reliability of the case study. First, was the formation of an explicit case study protocol. The case study protocol specifies all the procedures that were taken in each individual case and in the cross-case data analysis. Second, the formation of case data bases makes all materials used in the case study available for audit if an individual desires to repeat the study (Yin, 1994).

CHAPTER FOUR

RESULTS

Introduction

This chapter synthesizes the results of data collected through document analysis, semi-structured interviews and direct observations. These multiple-sources of evidence were compiled to reach congruence regarding the characteristics exhibited by each of the five organizations studied. Within each case, characteristics are presented under the five managerial elements examined, although they are not mutually exclusive. In sum, the subsequent information represents the results of conducting the data collection portion of the research.

Miramichi River Environmental Assessment Committee

Background and Legitimization

The Miramichi watershed drains approximately one quarter of the province of New Brunswick and encompasses an area of 13,465 square kilometres (MREAC, 1997). The Miramichi River is approximately 250 km in length and is world renowned for its recreational fishery of Atlantic Salmon. The headwaters of the watershed begin in the hinterland reaches of the province which are still referred to as “wild” and “remote” (MREAC, 1997).

As the river moves towards the coast, communities which encompass Acadian, English and first Nation cultures become increasingly prevalent. These communities reflect their historical foundations in resource extraction activities such as forestry, mining and fishing. Individuals in the small communities also place high regard on outdoor values such as hunting and fishing. In addition, tourism businesses based on these activities such as lodges and guiding are all important. In the introduction to their Comprehensive Environmental Management Plan, the Miramichi River Environmental Assessment Committee (MREAC) states that “other than these outdoor values, the people of the Miramichi reflect the typical

Atlantic Canadian family and community ('salt of the earth') values" (1997, p. 7). The environmental quality of the watershed is inextricably linked to the lifestyle and values of people residing in the Miramichi watershed.

The identity of the Miramichi River has been linked to the recreational fishing of the Atlantic Salmon. Local and regional organizations with a specific interest in the Atlantic Salmon have formed such as the Miramichi Salmon Association and the Miramichi Water Management Association. The Miramichi River Environmental Assessment Committee was the first and remains the only organization concerned with the broad values of water throughout the entire Miramichi system.

In the early 1980s, concern for the environment brought together some residents in the Miramichi area. These individuals, led by Mr. Ben Baldwin, raised the profile of practices which may adversely affect the environment. Attention was focused on Repap Enterprises Ltd. who had began to construct their A-2 paper machine. This machine uses chlorine in the production process of paper. Subsequently it was realized that construction of the A-2 paper machine had begun without the attainment of an environmental impact assessment. Therefore, the potential impact on the environment from this machine was unknown. As a consequence, the Provincial Department of the Environment required Repap to hold public meetings as a condition of their licence. The Committee on Public Information and Public Concerns was formed with Mr. Joseph O'Neil, Manager of Woodlands Operation for Miramichi Pulp and Paper Inc., as its Chairman. The 21 member committee met four times between January 16, 1989 and February 21, 1989 and made several recommendations (MREAC, 1992, p. 8) including:

1. a two - year study be made of the Miramichi River System to assess its health;
2. that the Committee stay in place to monitor the study;
3. that the Committee define the terms of reference for the study;
4. that the cost of the study be shared by Miramichi industries, municipalities, and both federal and provincial government agencies.

On April 18, 1989, the Miramichi River Environmental Assessment Committee (MREAC) became a legally incorporated entity. The 17 individuals which made up the original MREAC committee and their affiliations may be seen in Table 4.1. These individuals were recruited by initial key players -- Mr. Vernon Goodfellow, Mr. Joseph O'Neil and Mr. Jack Hunter.

The initial legitimization for MREAC came from the Provincial Department of the Environment who required REPAP to have a Committee on Public Information and Public Concern. In this early stage, legitimization for MREAC drew upon a mixture of legal and non-legal standing -- fulfilment by REPAP for their environmental oversight and recognition by the community.

Terms of reference for MREAC included "... an assessment of the environmental quality of the Miramichi watershed by way of point and non-point sources of pollution and the determination of the effect(s) of contaminants on water quality, on aquatic life and on the river sentiments" (MREAC, 1992, p. 9). The original Committee on Public Information and Public Concern had identified many areas to study based on people's perception of what was causing the problems. The estimated cost for such a study was \$100,000. MREAC then conducted a one-year review of all existing information in light of expressed concerns and the various users of the river, including: the nature of their use, the effect of use on different parts, and measures of health. Based on the aforementioned considerations, the two-year study was planned to include: 1) all point source waste disposal, 2) water chemistry, 3) bacteria counts, 4) sediment in the estuary, 5) chemical analysis of fish and shell fish tissue, and 6) counts of insects and other fish. The project was coordinated by Mr. Jack Hunter, a citizen, who worked closely with the Technical Assistance Group (TAG). The TAG (Table 4.2) was designed to act in a consultative role. MREAC's terms of reference outline that TAG shall consist of five MREAC members of which; two are from the Provincial Department of the Environment, two are from the Federal Department of Fisheries and Oceans, and one is from the Federal Department of the Environment. The Coordinator and Chair of MREAC are also

Table 4.1. Members of the Original MREAC and their Affiliation

Type of Participant	Number of Individuals Present	Organizational Affiliation	Sector
Federal Government (Public)	3	Department of Fisheries and Oceans	Fishery
	1	Environment Canada	Environment
	Total (4)		
Provincial Government (Public)	2	New Brunswick Department of the Environment	Environment
	1	New Brunswick Department of Natural Resources and Energy	Nat. Res.
	Total (3)		
Industry (Private)	2	REPAP New Brunswick Inc.	Forestry
	Total (2)		
Other (Public)	1	School Superintendent	Education
	Total (1)		
Other (Private)	1	Miramichi Commercial Fishermen	Fishery
	1	Northumberland Salmon Protection	Fishery
	1	Chartered Accountant	Business
	4	Citizens	Other
	Total (7)		

members of TAG. Dr. M. Burt from the University of New Brunswick was responsible for writing the final report. Support for the study was contributed from local industries, municipalities and special interest groups. The provincial and federal governments provided in-kind support. The MREAC finished its original task of assessing the health of the Miramichi River and concluded that there were three options: 1) continued uncontrolled growth, 2) stop all further growth, and 3) develop a sense of commitment to the river and convert that into an organized plan for phased improvements (MREAC, 1992). The MREAC committee asserted that “the committee believes that the only option is (3)!” (MREAC, 1992, p. 2).

Table 4.2. Members of the Technical Advisory Group (TAG) and their Affiliations

Member	Affiliation
Mr. Jack Hunter	Citizen
Dr. Vlado Zitko Mr. John Leagault	Federal Department of Fisheries and Oceans
Mr. Neil Brodie Mr. Mike Sprague	New Brunswick Department of the Environment
Dr. M. Burt	University of New Brunswick
Mr. George Lindsay	Environment Canada

In December of 1992, MREAC passed By-Laws and became a legally incorporated entity. These By-Laws encompassed many facets of the organization including; objectives and activities, jurisdiction, authority, organization, membership, meetings, board of directors, officers, technical advisory group, standing committees, finance, borrowing and other miscellaneous areas. These By-Laws outlined the way in which MREAC would function. It was apparent that “... MREAC needed a full-time coordinator as more than volunteer support was required to manage the many initiatives that had been recommended

in the 1992 report” (MREAC, 1992, p. 3). Concomitantly, Environment Canada launched the Atlantic Coastal Action Program (ACAP) through the Green Plan initiative. Through funding for the Green Plan, ACAP was aimed at “helping costal communities set objectives and strategies for a more sustainable future” (MREAC, 1997, p. 3). Participation in this program mandated that a full time coordinator be hired, that an office be opened, and that a comprehensive environmental management plan be completed. In 1993, MREAC joined the ACAP program and hired Mr. Harry Collins as a full-time coordinator. A business office was also established at 406 Water Street, Chatham, New Brunswick.

Prior to joining the ACAP program, MREAC had undertaken the formation of an action plan. These plans grew out of the State of the Environment Report that was released in 1992. Specifically, ADI Nolan-Davis, a consultant company, interviewed people from nine sectors of the community (Table 4.3) and with MREAC as an advisory group developed ten action items. These items were to move MREAC from assessment to action and are shown in Table 4.4.

Table 4.3. Sectors and Individuals Involved in Public Consultation

Sector	Number of Individuals Consulted
Industry	5
Business	5
Government (Fed., Prov., Mun., Aboriginal)	25
Commercial Fishery	2
Institutions	2
Transportation	1
Woodlot Owners/Farmers	4
Rural Households	not specified
Recreational Groups	1
Participants with no Sector Affiliation	12

Table 4.4. Problems Identified by MREAC and Corresponding Action Plans

Problem Identified	Action Plan
"Need to develop public awareness of the current environmental quality throughout the Miramichi River system and efficiently investigate any potential environmental concerns or accidents"	River Watch
"There are areas on the Miramichi River which are polluted due to the release of inadequately treated effluent and where the public should not swim"	Swim Watch
"Inadequately treated process effluent does not consistently meet all established environmental standards and has a negative impact on water quality and aquatic species"	Process Wastewater Treatment
"Inadequately treated municipal effluent does not currently meet all established environmental standards. This has a negative impact on the quality of the Miramichi River System"	Municipal Wastewater Treatment
"the release of inadequately treated domestic sewage represents a significant source of contamination. ... In the past there have been no studies completed in the area to help determine the severity of the problem"	Rural Wastewater Treatment
"A significant problem in the region results from the sedimentation of fish spawning habitat from land surface runoff"	Fish Habitat Protection
"Watershed mapping needs to be developed to help develop public awareness of the current environmental quality throughout the system as well as help coordinate study efforts for future management and research initiative"	Watershed Mapping
"There is no government department or agency which coordinates that various environmental monitoring and research activities which occur within the watershed"	Environmental Monitoring and Research
"There is a need to provide the general public with information about the current state of environmental quality"	Public Awareness/Information
"There is no local organization which takes a regional environmental interest to ensure that sustainable development occurs within the watershed"	Community and Land Use Planning

In addition to the formation of action items, MREAC developed an understanding with government agencies and industries during a one day workshop in the spring of 1993. Based on the recommendation of their 1992 report regarding the confusion and overlap of jurisdictional responsibilities, an understanding was reached by government agencies and industry players that MREAC would take a lead role in the watershed and act as a clearing house to direct environmental concerns, problems and research in the Miramichi watershed. In return, agencies and industry players agreed to have representatives as part of MREAC.

MREAC tried to increase the sensitivity of the public to environmental issues by hosting Miramichi River Awareness meetings. At these river awareness meetings, people were asked to state their concerns about the river. Response was low with only two individuals replying. The lack of public enthusiasm prompted MREAC to conduct a Public Awareness/Perceptions Survey. MREAC worked with Environment Canada on the project which was funded through the New Brunswick Environmental Trust Fund. A random survey of watershed residents was conducted by students hired from the Environmental Technology program at New Brunswick Community College, Miramichi. Overall the survey indicated “a concern for the environment, but a limited sense of individual responsibility for a clean river” (MREAC, 1997, p. 36). MREAC subscribes to the public for “moral authority” to legitimize their existence as environmental watchdog.

Contributions which have been made by numerous individuals, organizations and government agencies also provide MREAC with legitimization. Typically the contributions are of a financial or in-kind nature. Contributors, their sector affiliation and the type of contributions made are shown in Table 4.5. In-kind support includes a myriad of services ranging from the analysis of water samples to research consultation.

Since the release of the action plan in 1994, MREAC has worked towards completing many of the specific actions outlined. To fulfil the requirements of their ACAP contract MREAC completed the Miramichi Watershed Environmental Action Plan - Reaching 2002

Table 4.5. Contributions Made to MREAC

Contributor	Sector	Type of Contribution
Municipal Governments	(Public)	Financial and In-kind
Environment Canada	Various (Public)	Financial and In-kind
Department of Fisheries and Oceans	Fisheries (Public)	Financial and In-kind
N.B. Dept. Health and Community Service	Various (Public)	In-kind
N.B. Dept. Environment	Various (Public)	In-kind
N.B. Dept. Natural Resources and Energy	Forestry, Recreation, Mining (Public)	In-kind
Provincial Government (ETF)	(Public)	Financial
REPAP New Brunswick Inc.	Forestry, Industry (Private)	Financial and In-kind
Haeth Steele Division - Noranda Mining and Exploration	Mining, Industry (Private)	Financial and In-kind
New Brunswick Community College	Education (Public)	In-kind
H.M. Parlee & Company	Business (Private)	In-kind
EnviroCounsel Inc.	Business (Private)	In-kind
Miramichi Leader	Business (Private)	In-kind
Kouchibouguac National Park	Recreation (Public)	In-kind
Individuals	All Sectors (Private)	Financial and In-kind

(1997). The report provides a compilation of past accomplishments and future aims. Table 4.6 outlines measurable objectives that have been achieved.

As the initial ACAP program reached its end in 1997, it was agreed by MREAC members that MREAC “will remain intact as a watershed group beyond 1997 to fill a void of environmental oversight, to continue committee coordination and to act as an environmental watchdog” (MREAC, 1997, p. i). The organization membership has changed since its formation in 1989. The current membership of MREAC may be seen in Table 4.7.

MREAC exerts a considerable sphere of influence through: public recognition; the affiliation of members in their organization; and, the understanding MREAC has forged with industry, government agencies, and other organizations. When necessary MREAC exercises this influence by raising the profile of issues and working with the responsible party to rectify a situation. If necessary MREAC could use its recognition to take a confrontational position, however, it is undesirable.

Structure

The internal structure of MREAC consists of a four person executive, three-person staff, technical assistance group, directors, subcommittees, and general membership (Figure 4.1). The staff (coordinator) answers directly to the executive, as do the directors. The technical assistance group provides advice to the executive, staff, and directors. All positions, except the technical assistant group, are in direct contact with the general membership.

The internal structure of MREAC is governed by an election process. This process occurs at the annual general meeting. All executive positions are elected democratically, based on nominations. The chairperson and vice-chairperson positions have additional stipulations. The chairperson of the organization should not be from either government or industry, and may only serve a maximum of two one-year terms. The vice-chairperson may be from either government or industry, and may also only serve two terms. The remaining executive positions are open in terms of affiliation and length of term.

Table 4.6. Measurable Objectives that have been Achieved by MREAC

Achievements by MREAC (Miramichi Watershed Environmental Action Plan-Reaching 2002)
Watershed contributions from MREAC.
State of the environment report 1992.
Defining government jurisdictions and responsibilities for the watershed to assist in the Riverwatch program.
Influencing the upgrading of wastewater collection and treatment for the city of Miramichi.
Hosting annual Miramichi science workshops.
Hosting the three day "Miramichi Environmental Science Workshop" April, 1994.
Four years of water quality monitoring for public use in the Swim Watch program.
Rural wastewater surveying, status reporting and public awareness programs for onsite system maintenance.
Surveying watershed community environmental perceptions/awareness (summer, 1996).
Assuming lead agency role in a Canadian Heritage River System nomination from the Miramichi watershed.
Facilitating environmental management planning for small to medium sized businesses to develop environmental stewardship.

Table 4.7. MREAC's Present Membership

Type of Participant	Number of Individuals Present	Organizational Affiliation	Sector
Federal Government (Public)	3	Department of Fisheries and Oceans	Fishery
	1	Environment Canada	Environment
	1	Kouchibouguac National Park	Parks
	1	First Nations	Other
	Total (6)		
Provincial Government (Public)	3	New Brunswick Department of the Environment	Environment
	2	New Brunswick Department of Natural Resources and Energy	Nat. Res.
	2	New Brunswick Department of Health and Community Services	Health
	1	New Brunswick Department of Agriculture	Agriculture
	Total (8)		
Municipal (Public)	1	City Council	Other
	1	School Superintendent	Education
	1	Miramichi Planning District Commission	Planning
	Total (3)		
Industry (Private)	2	REPAP New Brunswick Inc.	Forestry
	2	Health Steele Division (Noranda)	Mining
	1	Eagle Forest Products	Forestry
	Total (5)		

Table 4.7. MREAC's Membership (continued)

Type of Participant	Number of Individuals Present	Organizational Affiliation	Sector
Other (Private)	1	Maritimes Fisherman's Union	Fishery
	1	EnviroCounsel Inc.	Environment
	1	Commercial Fisherman	Fishery
	1	Consultant	Business
	1	Chartered Accountant	Business
	1	Miramichi Commercial Fisherman	Fishery
	7	Citizens	Other
	Total (13)		
Other (Public)	1	University of New Brunswick	Education
	2	New Brunswick Community College	Education
	2	Local Education (Superintendent, Teacher)	Education
	1	Northumberland Salmon Protection	Fishery
	Total (8)		

Figure 4.1 Internal Structure of MREAC

The interface between the organization and external affiliations may occur through the general membership. Members and the coordinator of MREAC also form an important link to other organizations and agencies.

The external affiliations both define and support MREAC's administration, operations, and other responsibilities. MREAC concentrates on issues which are not the responsibility of other agencies or actors. Groups that have provided external support include: all levels of government, industry, universities and colleges, and Kouchibouguac National Park. An example of this external support occurred when Environment Canada helped to design the public perception survey. Other groups such as the Miramichi Historical Society, and the Miramichi Leader are two examples of local involvement. The former gives support through the provision of office space at a reduced cost, the latter publishes articles. External support also comes from linkages with other community-based groups. For example, MREAC has worked with the Northumberland Strait Sustainable Development Coordination Area Working Group on the 1995 document entitled "Rural Wastewater Management Issues in New Brunswick". They have also worked with ACAP sites from other provinces and other sustainable development groups in hosting the Southern Gulf of St. Lawrence Workshop.

Not all external affiliations of MREAC, however, have been positive. The New Brunswick Environmental Network refused MREAC's participation because they considered the organization a multi-stakeholder organization and, therefore, perceived them to be too close to government. Others have stated in the Telegraph Journal that MREAC is "not much of a watchdog" (October 20, 1997) because they are too close to industry to be an effective environmental group. Finally, Environment New Brunswick officials have been critical of Miramichi City. Bonnie Sweeney wrote the city "was not providing support to MREAC's environmental efforts in cleaning up the Miramichi River" (Miramichi Leader Weekend, August 2, 1996).

Roles and Responsibilities

The role that MREAC plays and the responsibilities it undertakes come from recommendations of the two-year state-of-the-environment study. It was the recommendations from this report which suggested that the advisory committee stay in place as a “watchdog”. The roles and responsibilities of MREAC are explicitly stated in the boundaries set by the Mission Statement and the Modus Operandi as printed in the MREAC Environmental Action Plan (1994, p. 3).

MREAC Mission Statement

The Miramichi River Environmental Assessment Committee (MREAC) is a citizen group dedicated to preserving and making phased improvements to the environmental quality of the Miramichi River and her watershed. The watershed encompasses the river estuary, bay, barrier islands and bay mouth. MREAC adopts the role of watchdog to ensure responsible use, maintenance and support of needed enforcement for the long and short term of the river. MREAC is also committed to the growth of Miramichi River Environmental awareness. At the same time MREAC will remain small, agile and unencumbered by much capital equipment or personnel. The committee is prepared to dissolve at a point where the Miramichi River is healthy and a concerned public assumes responsibility for its well being into the future.

Modus Operandi

MREAC recognizes that the mission can best be achieved by encouraging coordination, cooperation and consultation between interested groups and individuals resident or in some way involved in a regulatory capacity within the watershed. It is not MREAC’s intent to replace government responsibilities in enforcement or regulation. In this, MREAC will encourage action where appropriate, praise agencies doing good work and criticize those not fulfilling their custodial responsibilities. MREAC will thus be the public presence to monitor and report on the state of the environment of the Miramichi River. Further to this MREAC will defend appropriate and lawful enjoyment of the river that is free from interference, obstruction or pollution. In these undertakings, MREAC decisions and environmental programs will need to be based upon the best available science. Where scientific information is not available, studies will be recommended.

The roles and responsibilities of stakeholders within the organization can be seen in Table 4.8.

Processes and Mechanisms

The process of planning has provided a foundation for MREAC. After planning, organizing and implementing the 1992 State of the Environment Report, the organization

Table 4.8. Roles and Responsibilities of Stakeholders

Position		Role and Responsibility in Organization
MREAC Executive	Chairperson	The Chairperson is responsible for supervising the workings of the office. They are also responsible for conducting meetings which are held on the first Wednesday of every month.
	Vice-Chairperson	The Vice-Chairperson role is to fill the Chairperson's responsibilities if they are absent.
	Secretary	The secretary's role is to take minutes at the meetings and circulate them to the general membership. This responsibility has been given to the Coordinator.
	Treasurer	The treasurer is responsible for the finances of the organization. This role involves the preparation of a financial statement which is presented at the annual general meeting. The treasurer also has the responsibility of financial consulting.
	Past Chairperson	The Past Chairperson's role is consultative.
MREAC Directors	Fundraising	The responsibility of this director was to raise funds so MREAC could operate. Since fundraising has been secured until 1998/1999 the responsibility of this role has been temporarily removed.
	Membership	The director of membership is responsible for maintaining a record of MREAC's general membership and recruiting new members when numbers are getting down.
	Public Information/Awareness	The director of Public Information/Awareness is an oversight position. They have the responsibility of leading the subcommittee on various projects. The amount of responsibility depends on interest and time. The director works closely with staff which sit on the subcommittees.
	Special Projects	The director of special projects has the responsibility for undertaking tasks decided upon by the general memberships. These often may include acting as chairperson of a subcommittee.

Table 4.8. Roles and Responsibilities of Stakeholders (continued)

Position		Role and Responsibility in Organization
MREAC Directors	Air Resource Management Area	The director has the role of chairperson of the subcommittee. The responsibility of the subcommittee is to develop an air resource management area plan in one year.
MREAC Staff	Coordinator	The coordinator's role is to lead MREAC as an organization. Responsibilities of the coordinator include; implement the Reaching 2002 Plan (1997), spokesperson, office manager,; program director (supervise 14 programs), field investigator, field researcher, and financial records.
	Assistant	The primary role of the assistant coordinator is to directly help the coordinator. Responsibilities include; keeping financial records, organizing events, office management, and filling in any other gaps.
	EMP Coordinator	The EMP Coordinator's role is to implement site environmental management plans. Responsibilities included working with 12 businesses, representing various sectors, to integrate environmental issues into the business, and to compose a summary document.
Technical Assistance Group		The role of the Technical Assistance Group is to provide expertise to the staff, executive, and directors of MREAC.
MREAC General Membership		The role of MREAC's general membership is to guide the course of the organization.

undertook the task of developing means to reach their objectives. Following the published plans has provided the organization with general direction. Within this general direction MREAC has remained flexible to other opportunities, such as the nomination into the Canadian Heritage River System.

At the organizational level, decisions are voted upon by the committee at large. Membership is open to anyone, but they must be present at the meeting to have their vote count. The coordinator compiles the agenda and anyone may submit issues to be raised at meetings. When decisions are required, they are made by the general membership through a consensus process. If decision by consensus fails, decisions are made with the rule of majority. In addition to specific issues that arise, reports of ongoing initiatives are made by the coordinator at each meeting. Any questions, concerns or issues that stem from these programs are also addressed by the coordinator.

The coordinator is also responsible for the processes of organizing, influencing and controlling. Within the broad vision of the management plan, it is the coordinator who makes many of the decisions. It is also the coordinator's responsibility to develop and monitor a work plan within the framework of the management plan and monetary constraints. The budget for the organization is derived from the plan and developed by the coordinator. The coordinator subsequently presents the budget to the executive and revisions are made collectively. The coordinator also takes issues to other groups within the organization such as the TAG or executive. Controlling at the organizational level is to occur every five years. MREAC is prepared to dissolve at a point when the environmental issues in the watershed are being adequately addressed.

Organizational Culture

Generally, the members of MREAC exhibit a dedication to "preserving and making phased improvements to the environmental quality of the Miramichi River and her watershed" (1992, p. 11). In addition, it appears that the perception, attitudes and values of stakeholders which originally brought the first MREAC committee together continue to be the glue in the

fabric of the organization although members have changed over the eight year period. Of the 45 members; some individuals have consistently never attended a meeting, but have read the minutes; some individuals have moved away or retired; while others have moved to the area and began participating. There is, however, a core “lifeblood” group that have been consistent throughout MREAC’s history. It is the values and attitudes of this group that have defined and perpetuated the role of the organization. Individuals at various times, such as Ben Baldwin, who envisioned MREAC evolving in another direction have left the organization.

Within the operation of the organization individuals bring many perspectives. The open and supportive manner in which meetings proceed foster the voicing of concerns and the sharing of information by four general groups. Citizens often bring first-hand information involving issues within the watershed to the organization. Professionals share information from the position of governments and their ongoing investigations. The staff of MREAC bring issues arising from the various programs such as River Watch or Swim Watch and also share information on issues that have arisen from previous meetings. Finally, guest speakers are invited to attend and present at meetings. Past guests have included Garth Bengay, the Chairperson of the ACAP programs, and Mary Ann Coleman, the President of the New Brunswick Environmental Network.

One of the strengths of MREAC is rooted in the open participation format of meetings. Anyone who wishes to be a member is welcome. Stakeholder consultation often extends beyond the actual organization. For example, a local concern over the establishment of a monument on Middle Island was raised. When the individual approached MREAC as an ally to fight the project, MREAC consulted various stakeholders and sought expert opinions prior to consulting the committee at large. It was through stakeholder consultation that the concerns were determined to be unfounded.

At meetings and in documents, the organization generally uses a technical perspective. This perspective would appear to predominate and become a “common language” or means of explanation and reason among stakeholders. For example, at an

annual general meeting citizens articulated concerns in terms of “smells”, things they saw, and how things had changed in the past. Professionals attempted to address and explain these concerns in a technical way, referring to permits and procedures. During this time there appeared to be a certain amount of tension between the emotional non-technical and technical rationality perspectives. The different perspectives, however, did not hamper relations. If concerns were being addressed by the appropriate agency in the appropriate way (permits, processes, restrictions) consensus was reached.

Leadership of the organization, primarily taken by the coordinator and chairperson appears to be well supported. The coordinator seems to maintain good working relationships with members of the organization. The general membership, executive, and directors generally follow the coordinator’s lead and support the decisions which are made. The meetings are well organized, well facilitated, and the chairperson enjoys good rapport with members.

Monitoring and evaluation is performed by the coordinator by measuring the amount of progress the organization makes towards specific actions as outlined in the action plans. Based on this measure, the organization is considered “successful.” Specific initiatives have been accomplished in each outlined action plan. As these original plans reach fruition, the scope and size of action items continue to expand. Although the organization continues to expand, it remains true to its roots of being a watchdog for environmental issues.

Bathurst Sustainable Development Project

Background and Legitimization

The rural Nepisiguit watershed and town of Bathurst have long relied on extractive industries such as mining, manufacturing and forestry (Bathurst Sustainable Development Project, 1996). As a consequence of the previous industry practices, much of the watershed and bay area have been severely degraded. Shellfish harvesting in the bay area is not permitted due to heavy metal contamination, residential and industrial waste has been disposed of in

untreated form downriver from swimming areas, and contaminated mine sites have been abandoned (Bathurst Sustainable Development Project, 1996). The social and economic well being of the citizens are linked to the associated industries.

In February 1995, the town of Bathurst experienced a strike by “blue collar workers.” As a result of this strike and the lack of an adequate backup sewage system, raw sewage was pumped directly into the local harbour. Once realized, the media exposed the environmental degradation. The ramifications of the situation were heightened because the Minister of the Environment, Marcelle Mersereau, was from Bathurst. Shortly after this incident, concern about the Nepisiquit watershed was expressed by Marcelle Mersereau. Since the sustainable development program is/was supported by the Environmental Trust Fund, a source of financial support for environmental initiatives which the Department of the Environment controlled, and the Nepisiquit watershed was part of her home riding, the then Minister of the Environment saw the establishment of a sustainable development project as an opportunity to address many daily issues.

The organization’s roots extend to the Premier’s Round Table on the Environment and the Economy in 1988. Under the 1992 Provincial Policy of Sustainable Development, the Provincial Department of Fisheries and Aquaculture developed the concept of sustainable development sites to address their concerns in the marine sector by addressing effluent discharge in watersheds. These groups were to be a “government-coordinated, community-based mechanism which focused upon the individual watershed” (New Brunswick Department of Fisheries and Aquaculture, 1995, p. 4). Such sites are established in areas where concern has been expressed regarding the water quality of the surrounding watersheds. It is the vision of the Department that in time these sites will be linked to form a province wide network.

The intent of each sustainable development project is to deal with environmental issues by bringing all people affected by detrimental water quality together with those causing the detriments. Individuals that are included are: those responsible for regulation, scientists

and all governmental levels that have an influence. After these individuals are brought together they are to deal with issues by directing the issue to the appropriate government agency and seek their response. Further, the organization is not a “green” group. As a sustainable development site, the organization’s intent is not to sacrifice jobs in return for environmental quality; but rather to strike a balance between environment quality and the economy.

Extending from the environmental and political situation, the Bathurst Sustainable Development Project was created in July, 1995. Funding support for the effort was secured from the New Brunswick Environmental Trust Fund for a span of three years. In July 1995 a project office was established at 495 Riverside Drive in Bathurst. The project manager hired a field coordinator, public relations officer, summer field technician, and a secretary. The public relations officer invited approximately 40 individuals that represented the public, government, and industry to attend the first working group meeting. Individuals which attended this first meeting and their affiliation may be seen in Table 4.9. The working group met at Danny’s Colonial Inn in Bathurst, New Brunswick, on November 3, 1995.

At this first meeting, Dr. Barry Jones described the manner in which the working group, technical committee and communications committee would function. Participants were requested to submit names to the two standing committees (technical and communication) and any others to be a member of the working group. A preliminary investigation conducted by the field coordinator identified eleven issues that required addressing. The public relations officer presented the principal programs undertaken in terms of public awareness and school education. Associate programs such as the Youghall Lagoon Project, ICOIN Project and New Brunswick ACAP sites were also presented. Subsequently, the two standing committees formed and met.

Issues which the Bathurst Sustainable Development Project have addressed since their formation are shown in Table 4.10. Direct actions undertaken by the project are carried out by the field technician. The organization also implements education/awareness programs which are detailed in the communications plan that was developed in July of 1996. Public

Table 4.9. Individuals Present at the First Working Group and their Affiliation

Type of Participant	Number of Individuals Present	Organizational Affiliation	Sector
Federal Government (Public)	2	Environment Canada	Environment
	2	Fisheries and Oceans	Fisheries
	Total (4)		
Provincial Government of New Brunswick (Public)	4	New Brunswick Department of Fisheries and Aquaculture	Fisheries
	1	New Brunswick Department of Human Resources	Other
	2	New Brunswick Department of the Environment	Environment
	3	New Brunswick Department of Health and Community Services	Other
	1	New Brunswick Department of Natural Resources and Energy	Nat. Res.
	1	New Brunswick Department of Municipalities, Culture and Housing	Other
	1	Member of the Legislative Assembly	Other
	Total (13)		
Municipal Government (Public)	1	Mayor of Bathurst	Other
	1	City of Bathurst	Other
	1	Bathurst Chamber of Commerce	Business
	1	Chaleur Economic Development Commission	Business
	1	Associations des Municipalites du Nouveau-Brunswick	Other
	1	Belledune District Planning Commission	Planning
	Total (6)		

Table 4.9. Individuals Present at the First Working Group and Their Affiliation
(continued)

Type of Participant	Number of Individuals Present	Organizational Affiliation	Sector
Industry (Private)	1	Brunswick Mining and Smelting Commission	Mining
	2	Stone Container (Canada) Inc.	Mining
	1	REPAP	Forestry
	Total (4)		
Community-Based Water Management Groups (Private)	3	Bathurst Sustainable Development Project	Other
	1	Caraquet Sustainable Development Project	Other
	1	Miramichi River Environmental Assessment Committee	Other
	Total (5)		

Table 4.10. Issues Addressed at the Bathurst Sustainable Development Project

Specific Targets Presented	Examples of Issues Addressed
Septic Systems / Pumpers / Dumping	Example: Examine the status of septic system and wells at Youghall Beach.
Sewage Treatment Plants	Example: Investigation of secondary sewage treatment from the Atlantic Host Inn on the Tetagouche River.
Solid Waste Sites / Management	Example: Investigated the storage of containers by TREBOR line Painters.
Liquid Waste Management	Example: Investigated TREBOR line Painters flushing tanks, etc. on residential lawns.
Debris / Sediment / Leachate	Example: Wrote a letter to the Minister of Natural Resources regarding the waste leftover after fishing shanties were dismantled.
Business / Industrial Effluent	Example: Investigation of the sewage problem from Chaleur Centre in the Little River.

relation efforts can be seen in Table 4.11. In addition, associated projects are also addressed and discussed. Examples of associated projects are shown in Table 4.12.

The Bathurst Sustainable Development Project has continued to function and is now in the third year of existence. Attendance at the working group averages approximately 15 individuals. The working group presently consists of 41 members with their affiliations as shown in Table 4.13. As the organization moves beyond 1997, it looks to expand its boundary to the neighbouring watershed.

Legitimization was initially given to the Bathurst Sustainable Development Project by its creators, the Provincial Department of Fisheries and Aquaculture. As other agencies and actors have become members, credibility has been continually enhanced. Interaction with citizens through public relations efforts also contribute to the recognition of the organization.

Contributions have been made by government agencies that also give the organization credibility. The Bathurst Sustainable Development Project is solely dependent upon the Environmental Trust Fund for financial contributions. In-kind support comes from the Provincial Department of Natural Resources and Energy in the form of office space and equipment.

Although the organization does not have enforcement or regulatory authority, it does subscribe to an acceptance authority. Since the organization has been accepted politically (government) it is able to garner cooperation and input from different departments. In addition to this participation “pressure,” there is also a desire to participate in a “successful” process. When individuals are around the table, the chairperson may ask them to address certain issues. Given the presence of the public and other agencies, departments may shift their priorities to address the requested items.

Structure

The internal structure of the Bathurst Sustainable Development Project takes the form of a hierarchy consisting of a working group, two standing committees and a project

Table 4.11. Principle Programs Undertaken For Public Relations

Principal Program	Example of Activities
Public Education	Included under this program is a wide range of activities that fall under the communications report. Example: held public meeting on October 30th, 1996 to which 32 residents attended; published articles, newsletters and information sheets; and, held workshop for teachers on sustainable development.
Resource Centre	Example: Resource centre consists of 233 documents, videos and approximately 20 geographic maps.
Sanitary Shoreline Survey	Example: Conducted a shoreline survey and followed-up on potential issues.
Water / Effluent Sampling	Example: Various sampling undertaken by the Field Technician.
Land Use Planning	Example: Received reports of land use and planning activities underway by the Department of Municipalities, Culture and Housing.

Table 4.12. Associated Projects of Bathurst Sustainable Development Project

Associated Projects
ICOIN Project. This project is being completed for the Department of Fisheries and Aquaculture to model the sustainable development process.
New Brunswick ACAP Sites. Presentations from Harry Collins of the Miramichi River Environmental Assessment Committee about their ACAP site.
Other Sustainable Development Projects. Presentations and interaction with other sustainable development projects.
Other associated projects are discussed as they are undertaken to determine the involvement that the Bathurst Sustainable Development Project should take.

Table 4.13. Present Members of the Working Group and Their Affiliations

Type of Participant	Number of Individuals Present	Organizational Affiliation	Sector
Federal Government (Public)	2	Environment Canada	Environment
	1	Fisheries and Oceans	Fisheries
	1	Chief of the First Nation, Pabineau Reserve	Aboriginal
	Total (4)		
Provincial Government of New Brunswick (Public)	2	New Brunswick Department of Fisheries and Aquaculture	Fisheries
	3	New Brunswick Department of the Environment	Environment
	3	New Brunswick Department of Health and Community Services	Other
	2	New Brunswick Department of Natural Resources and Energy	Nat. Res.
	2	New Brunswick Department of Municipalities, Culture and Housing	Other
	1	New Brunswick Department of Transportation	Transportation
	1	New Brunswick Department of Agriculture	Agriculture
	Total (14)		
Municipal Government (Public)	1	Mayor of Bathurst	Other
	1	Bathurst Chamber of Commerce	Business
	1	Chaleur Economic Development Commission	Business
	1	Belledune District Planning Commission	Planning
	1	Solid Waste Commission for Nepisiguit Chaleur	Environment
	Total (5)		

Table 4.13. Present Members of the Working Group and Their Affiliations (continued)

Type of Participant	Number of Individuals Present	Organizational Affiliation	Sector
Industry (Private)	2	Stone Container (Canada Inc).	Mining
	1	REPAP	Forestry
	1	Noranda Mining and Exploration Inc.	Mining
	1	East West Caribou Mines	Mining
	Total (5)		
Community-Based Groups (Private)	3	Bathurst Sustainable Development Project	Other
	1	Nepisiguit Salmonid Management Committee	Fisheries
	1	Miramichi River Environmental Assessment Committee	Environment
	1	Long Run Wilderness Environmental Group	Environment
	Total (6)		
Other Interests (Private)	1	Washburn and Gillis Assoc. Ltd.	Business
	1	Northern Light Newspaper	Business
	1	Times Transcript	Business
	1	Telegraph Journal	Business
	1	New Brunswick Community College	Education
	4	Citizens	Other
	Total (9)		

team as shown in Figure 4.2. The working group consists of invited government, business and community members, but is also open to anyone who is interested. The two standing committees serve the working group. The project team is headed by the project manager and consists of a field coordinator, public relation officer and field technician.

Within the overall process of the organization, the project team serves the working group. Within the project team, all individuals must be from the local Bathurst area. Such individuals are hired by the project manager based on the recommendation of local politicians. The field coordinator tends to be a “technical” person because of the requirement of understanding complex ecological relationships. The chairperson of the technical and communication committee must also be from the local area. The project team is linked to the various other parts of the organization. The project manager, Dr. Barry Jones, is also the chairperson of the working group. The field coordinator acts as a secretary to the working group. The technical and communication committees also have the field coordinator and public relations officer as secretaries.

The interface between the Bathurst Sustainable Development Project and the external operating environment occurs in three ways. First, influence is exerted through following the political chain of command to elicit responses to issues. Second, the public relations officer serves as a liaison between the site and the community. Finally, interaction occurs as people bring issues to attention and members take these concerns to their respective organizations.

The Bathurst Sustainable Development Project is supported by an external structure. The organization received office space inside of the Department of Natural Resources and Energy - Mines and Resources Branch building, but the local office was not aware of this arrangement. Government agencies, at all levels, have supported the organization by sending representatives to meetings and bringing issues to the table. The public has also supported the organization by participation in the working group and other programs such as the beach clean-up.

Figure 4.2. The Internal Structure of Bathurst Sustainable Development Project

The organization has formed linkages with other community-based water management organizations. The five sustainable development sites in the province meet once a year to discuss common experiences. The Bathurst Sustainable Development Project most frequently communicates with the Bouctouche Sustainable Development Project because they were the first project established.

Roles and Responsibilities

The role of the Bathurst Sustainable Development Project is explicitly stated in the mission statement and objectives presented in the terms of reference for the sustainable development projects.

Mission Statement

To facilitate local community, business and government interactions for the long-term mutual betterment of environmental quality, economic health and social well being (New Brunswick Department of Fisheries and Aquaculture, 1995, p. 3).

Objective

The primary objective of each project is to bring together relevant members of government departments at all levels, local businesses and community groups to coordinate efforts toward harmonizing economic development and environmental health. This includes improving upon current environmental problems and consequently reducing the detrimental impact on living resource-based industries.

In more specific terms, the focus will be on reducing the impact of effluent entering the watersheds and subsequently coastal waters through cleaning up past mistakes, helping current businesses and communities meet today's standards and planning input to prevent future problems. These can only be achieved if all members work together to find and lend their weight to long term solutions (New Brunswick Department of Fisheries and Aquaculture, 1995, p. 1).

The overall role of the Bathurst Sustainable Development Project is to offer citizens a forum where they can express environmental problems and solve them at their level. Answers to the problems come from Bathurst rather than Fredericton or Ottawa.

The Bathurst Sustainable Development Project has taken on the responsibility to address and balance environmental and economic concerns through actions. Any specific water or environmental problems that arise in the Nepisiquit Watershed are the responsibility of the organization. The organization has also undertaken the responsibility for issues that

will be long-term and emphasizes an educational perspective. There is also a responsibility to make the organization known within the community.

Within the organization, each position has specific roles and responsibilities. The roles and responsibilities of individuals in the organization are outlined in Table 4.14.

Processes and Mechanisms

The Bathurst Sustainable Development Project facilitates stakeholder participation through the working group. Representatives of the community, business and government are invited by the public relations officer to form a working group which meets bi-monthly. The working group is chaired by Dr. Barry Jones, a senior member of the Department of Fisheries and Aquaculture. The purpose of this working group is to “produce results by translating local concerns directly into actions” (New Brunswick Department of Fisheries and Aquaculture, 1992, p. 1). To facilitate this process the organization uses an “open, no-fault basis to establish greater credibility and trust among its partners” (New Brunswick Department of Fisheries and Aquaculture, 1992, p.1). Anyone may bring an issue or concern to the table. In this way, stakeholders are offered a forum in which they may express concern about issues. The Bathurst Sustainable Development Project then finds an answer to the issue or determines which government agency’s jurisdiction the issue falls under.

The process of planning and decision making involves multiple steps. Once an issue has been brought to the attention of the organization, the chairperson directs the problem to the appropriate government agency. The organization ensures that each issue is addressed appropriately. This may include a status report, evaluation of the problem significance, and/or the development of an action plan and implementation plan. The issue remains on the table with its status updated at each meeting until the issue has been resolved. If the issue is not being resolved, the chairperson, on behalf of the group, will write a letter to the deputy minister seeking additional help. If an issue that reaches the table requires a response by the organization because it does not fall under the mandate of a government agency then the working group discusses the issue. Similarly, the issue remains on the table until the group

Table 4.14. Roles and Responsibilities of Stakeholders in the Bathurst Sustainable Development Project

Position		Role and Responsibility within the Organization
Working Group		The role of the working group is to be an open forum for discussion. The working group is responsible to identify local issues or problem areas and develop response plans if possible. It also approves and monitors responses.
Chairperson		The role of chairperson is to be neutral and preside over the meeting. This individual is responsible to be facilitate discussion among stakeholders and ensure that all items on the agenda are covered. In addition, it is his/her responsibility to ensure that no conflicts occur.
Standing Committees	Technical	The role of the technical committee is to look at the technical side of issues that are brought to the table. It is the responsibility of this committee to identify, address, and explore the possibilities of any issue. In addition, it is the responsibility of the technical committee to evaluate, prioritize and assign subsequent actions.
	Chairperson	The chairperson's role is to chair the discussion within the committee and be the link to the working group. It is his/her responsibility to see that the committee has sufficient breadth.
	Secretary	The role of the secretary is to take minutes at the committee meetings. It is the responsibility of the secretary to contact the members for the meeting, write and distribute the agenda.
	Communications	The role of the Communication Committee is to examine the various elements of communication that take place with the community. It is the responsibility of this committee to address public awareness and education within schools, and to promote stewardship.
	Chairperson	The chairperson's role is to chair the discussion within the committee and be the link to the working group. It is his/her responsibility to see that the committee has sufficient breadth.
	Secretary	The role of the secretary is to take minutes at the committee meetings. It is the responsibility of the secretary to contact the members for the meeting, write and distribute the agenda.

Table 4.14. Roles and Responsibilities of Stakeholders in the Bathurst Sustainable Development Project (continued).

Position		Role and Responsibility within the Organization
Project Manager		<p>The role of the program manager is to keep the process alive and to develop a structure towards a province wide basis. The responsibility of the program manager is at a higher level to ensure that forums are available throughout the province. This individuals also follows up on issues from all regions at the higher level. Since this individual is typically a senior member of the New Brunswick Department of Fisheries and Aquaculture they have closer ties to the "power structure" and, therefore, are responsible for writing to Deputy Ministers and Ministers as appropriate when priority is not given to an issue.</p> <p>The program manager also acts as a liaison between the Bathurst Sustainable Development Site and other similar structures in the province. It is his/her responsibility to seek cooperation among element in the Bathurst area that may be controlled from outside. For example, an individuals involvement may be controlled from their boss which resides elsewhere.</p> <p>The program manager also acts as a liaison between the Bathurst Sustainable Development Site and other similar structures in the province. It is his/her responsibility to seek cooperation among element in the Bathurst area that may be controlled from outside. For example, an individuals involvement may be controlled from their boss which resides elsewhere.</p> <p>Finally, the project manager also determines the funds allotted to the organization and controls the hiring and firing of the staff. This hiring is based on the recommendation of local politicians. The program manager is directly responsible for all on-site staff and advises the field-coordinator.</p>
Staff	Field Coordinator	<p>The role of the Field Coordinator is to run the project on site. The Field Coordinator is responsible to maintain the liaison between the community and follow up on every action which is proposed and found acceptable by the working group. The field coordinator is also responsible for operating the site office. He/she also plans for the activities of the field technician and supervises the activities of the public relations officer. In addition, he/she makes the agenda for the working group meetings, acts as secretary to both the working group and the technical advisory committee, and provides minutes for each of the above.</p>
	Public Relations Officer	<p>The role of the Public Relations Officer is to interact with the public. This individual is responsible for planning, writing and implementing a communications plan for public information and education. Programs include: establishing a resource centre; school education; teacher education; and, making contributions to the newspaper. He/she also is responsible for inviting everyone to the working group and acting as secretary for the communications committee.</p>
	Field Technician	<p>The role of the field technician is to conduct field research. The responsibility of this individual depends on the assignments which are given by the field coordinator.</p>

has agreed (consensus) on an approach and response. In the Communications Committee, planning is achieved by following a communication plan. The plan was created at the onset of the project by the public relations officer and contains objectives of what the public relations officer wished to accomplish over three years. It was also identified that these objectives may change as the project evolved. The plan was based on the accomplishments of a similar undertaking in Bouctouche. The programs outlined in the original plan may be seen in Table 4.11. A mechanism exists in the communications plan to ensure that the organization's data base would be placed in the public library if the organization ceases to operate.

Within the project team decisions are made through a hierarchy. The individual with the most direct authority and control over the organization is the project coordinator from the Department of Fisheries and Aquaculture, Dr. Barry Jones. In the case of Bathurst Sustainable Development Project, the project coordinator also serves as program manager and the chairperson. Besides the general decisions made by the working group, the project manager takes a certain amount of liberty in making decisions if opportunities present themselves which fall within the scope of the organization and are thought to be desirable by the working group. Although there is an amount of logical response made on site by the field team, all decisions are predicated by support from individuals in the department hierarchy. Decisions regarding actions, press releases, letters, etc all follow a chain of command from the program manager to the field coordinator. The field coordinator exercises control over the remainder of the field staff which includes the public relations officer and field technician positions. For example, if the public relations officer wishes to publish an article in the newspaper he/she must first get the field coordinator to approve it, then the program manager, and, finally, the communications person at the Provincial Department of Fisheries and Aquaculture approves it for spelling and grammar.

The overall working budget is given by the program coordinator, Dr. Barry Jones, to the field coordinator. This budget is the result of funding from the Environmental Trust Fund. It is the responsibility of the field coordinator to administer the budget.

Evaluation and monitoring of the organization occurs by analysing the number of issues solved. The broad forum process used means that any number and size of issues may be brought to the attention of the organization. Monitoring is an ongoing process, occurring at the meetings which occur bi-monthly. Issues remain on the agenda until an answer is found.

Organizational Culture

Overall, the stakeholders that constitute the Bathurst Sustainable Development Project have pursued the objective outlined under the role of the organization. Explicit in the terms of reference is the emphasis on all members working together for the goal of sustainable development. This value would appear to be common in the approximate 41 members of the working group.

In addition to the values held, the perception and attitude of both the project staff and the members of the working group defined the organizational culture. It is the perception and the attitude of the project team and working group that leadership is to be taken by the project team. Within the working group forum the neutral chairperson, Dr. Barry Jones, plays a leadership role. This individual calls the meeting to order and ensures the group addresses the items on the agenda. They also are responsible to deal with any conflicts that arise, however, conflict does not occur openly in the working group because of a personal philosophy that the process is meant to be a resolution strategy rather than an opportunity to assign blame. The chairperson also directs action items, jobs that need to be done, directly to the field coordinator whom acts as a secretary for the group.

The project team also takes a leadership role during meetings of the working group. In addition to the field coordinator acting as a secretary for the group, the field coordinator also makes the agenda and presents the review of specific targets to the group. Subsequently the field coordinator follows-up on the action items which are assigned to them by the chairperson. The public relations officer for project team presents the review of principal programs. Within the project team leadership and control are held by the project coordinator

and project manager, Dr. Barry Jones. This individual created the sustainable development program and controls the funding, hiring and firing of individuals.

The perception and attitude of participants appear to reflect the lead role by the chairperson and project team. Participation in the working group is a reflection of this perception. At the initial meeting, 36 individuals were present. During the second year attendance averaged approximately 13 individuals (two individuals were from the project staff and one chairperson). Both the leadership and participants have the attitude that attendance at meetings is only necessary if an issue is important to the particular individual and their affiliated agency. In the two standing committees, the project team was not to take a leadership role. The field coordinator and public relations officer serve in a secretarial capacity and chairpersons were elected from the members. These groups have met irregularly, approximately once a year.

The organizational culture is thus oriented towards solving specific problems as they are brought forward. The “language” used within the organization focuses on the technical dimensions to determine the nature of the issue. Once the issue is determined, attention is focused on determining what government agency’s mandate the problem falls under. The working group will receive a status report from the field coordinator and the chairperson will direct any specific questions to the agency whose mandate the problem falls under. The working group is open to all people and those that come forward to put an issue on the table often remain until they have been provided with an answer, but are often not retained in the organization.

Trout Creek Model Watershed

Background and Legitimization

During the early 1990s, the natural environment of the Kennebecasis watershed was in poor condition. Issues of concern included erosion, farming and fishing (recreational and commercial) (Sussex Fish and Game Association, 1994). Concern about the state of the

environment was highlighted by anglers and hunters. In the spring of 1994, the Federal Department of Fisheries and Oceans approached the Sussex Fish and Game Association and the Kennebecasis Salmon Association to start a sub-watershed group under the Canada/ New Brunswick COOPERATION Agreement on Recreational Fisheries. The priority for the Sussex Fish and Game Association was to actively do rehabilitation work. In the spring of 1994, the Kennebecasis Sub-Watershed Committee was formed. Groups involved in the formation of this organization are shown in Table 4.15. The goal of this project was to “obtain a thorough habitat assessment of the watershed and to identify the problems that exist within the Kennebecasis river and its tributaries”(Sussex Fish and Game Association, 1994, p. 1).

Between July 14, 1994, and October 12, 1994, a habitat assessment on 265 km of the Kennebecasis River watershed was undertaken. Although the Canada / New Brunswick COOPERATION Agreement on Recreational Fisheries program did not have the final database prepared, the organization compiled the data in Excel format. Problems identified from the assessment included; erosion, lack of riparian habitat and past land use practices. The overall conclusion (Sussex Fish and Game Association, 1994) of this assessment stated that:

Successful rehabilitation of the Kennebecasis watershed will require improved land use practices in agricultural and residential areas which will require public awareness, education and community involvement. In addition, erosion control, bank stabilization, and riparian zone re-establishment is required to prevent further habitat loss. Restoration efforts will also need to incorporate the use of in-stream enhancement such as digger logs, wing deflectors and log-v weirs to improve salmonid habitat by narrowing and deepening channelled stream sections.

Concomitantly, other groups were also addressing environmental concerns in the Kennebecasis watershed. The Fundy Model Forest, the Universite de Moncton and the Sussex Fish and Game Association were cooperatively working on stream restoration within the Fundy Model Forest. In addition, the Agriculture Best Management Committee was planning to apply improved land use practices. This Committee was comprised of the Provincial Department of the Environment, the Provincial Department of Agriculture, the

New Brunswick Soil and Crop Improvement Association and the Kings County Soil and Crop Improvement Association. Both of the aforementioned efforts consulted the Federal Department of Fisheries and Oceans for technical support. Realizing that the two groups had a similar goal, to better the watershed, members of the Federal Department of Fisheries and Oceans suggested a union.

The Trout Creek Model Watershed Committee was formed in the late fall of 1994. The organization was spearheaded by the Sussex Fish and Game Association and the Kennebecasis sub-watershed committee. The organization was described as “a non-profit, organization that consists of a diverse association of community groups, governmental agencies and land owners residing and farming in the Trout Creek Watershed” (1996, p. 3) Upon formation the:

goal of the Trout Creek Model Watershed Committee is to develop and implement methodology for watershed protection and stream enhancement using Trout Creek Watershed as a model. The objectives of the Trout Creek Model Watershed project are: to develop and implement cost effective techniques for the improvement and protection of salmonid habitat and land preservation, the improvement of water quality, and to increase the public awareness in the importance of riparian and stream habitat (1995, p. 3).

The Trout Creek watershed was chosen because it was a reasonable size and it exhibited challenges typical of the drainage basin -- starting pristine and degrading as it flows through agriculture and urban areas. An initial public meeting was held in December of 1994 at Sussex Corners to tell the public about the goals of the organization and gain community input into the different types of projects that the organization should undertake. In addition to general advertising, specific people that lived in the watershed were invited. The initial partners are shown in Table 4.15.

A coordinator was hired for the project and an office was donated as in-kind support from the Canadian Forest Service. The coordinator's immediate job was to make application to a number of organizations to secure funding for projects. Projects that have been undertaken since 1995 are shown in Table 4.16.

Table 4.15. Partners in the Kennebecasis Sub-Watershed Committee
(Kennebecasis River Project) and the Trout Creek Model Watershed Committee.
Adapted from TCMW (1995, p. 1)

Organization	Membership
Kennebecasis Sub-Watershed Group	Sussex Fish and Game Association
	Kennebecasis Salmon Association
Trout Creek Model Watershed	Atlantic Salmon Federation
	Canadian Forest Service
	Federal Department of Fisheries and Oceans
	N.B. Department of Agriculture
	N.B. Department of the Environment
	N.B. Department of Natural Resources and Energy
	N.B. Department of Transportation
	Kennebecasis Salmon Association
	Kings County Soil & Crop Improvement Association
	N.B. Soil & Crop Improvement Association
	Parish of Waterford
	Sussex Town Council
	Sussex Corner Council
	Sussex Fish & Game Association

Table 4.16. Activities and Projects Undertaken by Trout Creek Model Watershed Committee Since 1995

Type of Initiatives	Brief Description of Initiative
Activity	A creel census was conducted on the Kennebecasis River system to provide baseline data regarding fishing pressure and catch rates. Recommendations were made to change sport fishing regulations.
Activity	A crossing survey was conducted. One hundred and twenty crossing were considered and recommendations for improvement were made.
Activity	A riparian restoration campaign was aimed at public awareness and fostering community participation. Ten thousand pamphlets and 500 posters on "What You Can Do To Help Restore The Kennebecasis River Watershed". Schools, interest groups and municipalities were contacted and alerted to the Trout Creek Model Watershed's purpose. Multi media was used to continue the campaign, in addition to giving forty two presentations.
Activity	Riparian zone planting were undertaken and involved participation by other groups such as the girl guides.
Activity	A vegetative assessment was undertaken for the entire watershed through aerial photo interpretation.
Projects	A number of stream restoration projects have been undertaken. Projects have included; Parlee Brook, Mill Brook, Ward's Creek, Mechanic Lake, McLeod Brook, Trout Creek and Cassidy Lake. In these projects innovative stream restoration techniques were used that include; digger logs, log crib work, rock groynes, rock sills, agriculture fords and backsloping.
Project	A counting fence was constructed in 1995 to gain information on native sea-run Brook Trout and the affects of the new regulations. These no-kill section regulations were initiated by the Sussex Fish and Game Association and the Trout Creek Model Watershed Committee. In 1996 this project was undertaken with the University of New Brunswick and the Fundy Model Forest.
Monitoring	Temperature monitoring was achieved through the use of two hobo monitors. The monitors were retrieved and downloaded to provide comparative data.
Activity	Water quality sampling continues on a yearly basis to flag any significant water quality problems.
Activity	Temperature profiles were conducted on Ward's Creek, Parson's Brook, and Mill Brook to assess cold water inputs.
Activity	Electroseining was conducted to assess the juvenile salmoid population.
Activity	Redd counts were conducted to better understand population dynamics.

In 1996, the organization developed a five year strategic plan. The strategic plan, outlined in Table 4.17, was formed by consensus and based on the assessment conducted in 1994. In addition to the new restoration efforts which have been summarized in Table 4.16, some activities were undertaken that contribute to the broadening of the organization. From April 1, 1996 through March 1997, 42 presentations were made to schools, community groups, municipalities, and government agencies. These talks were part of a riparian restoration campaign which also included the development and distribution of ten thousand pamphlets and five hundred posters on the topic of "What You Can Do To Help Restore The Kennebecasis River Watershed." Many different media were utilized such as news paper articles, radio interviews, mall displays and public field days to raise awareness of Trout Creek Model Watershed's goal.

The organization has made the greatest inroads with the farming community. This group was skeptical of some of the experimental techniques. In addition to strengthening existing partnerships, the organization also has looked for new partners as appropriate. When a number of the projects touched on transportation issues, a partnership was formed with the Provincial Department of Transportation in 1996.

As the organization moves beyond 1997 to 1998, Trout Creek Model Watershed continues to follow their strategic plan. Some of the projects include: stream restoration, public and school education, and expanding the community-based initiative. The organization also continues to form meaningful partnerships to achieve their goals. A possible future partnership is the green-way initiative. Once the organization achieves its immediate goals, it has the larger vision of taking the lessons learned to others within the Kennebecasis watershed and apply remedial measures.

The Trout Creek Model Watershed organization is not a legally incorporated entity. Rather, it is a number of partners that have agreed to work together. Agreement on the types of projects that will be undertaken is reached through consensus. The legal standing of the

Table 4.17. The Strategic Plan for the Trout Creek Model Watershed Committee
(adapted from TCMW 1997, p. 4).

Elements of the Strategic Plan
<ol style="list-style-type: none"><li data-bbox="258 464 1354 611">1. Use the 1994 Kennebecasis River Project Habitat Assessment to identify and prioritize problems and sites of concern. The assessment is to be used to guide the actual work carried out in subsequent years.<li data-bbox="258 611 1354 821">2. Set up the Trout Creek watershed as a model within the Kennebecasis watershed. By focusing on a smaller area, work can be carried out in a sufficiently concentrated results to show tangible results, for the problems that need to be addressed in the Trout Creek watershed are representative of the problems found on the Kennebecasis watershed as a whole.<li data-bbox="258 821 1354 989">3. Carry out in-stream work, starting at the headwaters of Trout Creek and working toward its confluence. Implement techniques to restore watercourses to their natural state by improving fish habitat, bank stability, riparian vegetation and land use management practices.<li data-bbox="258 989 1354 1272">4. Implement an effective public relations and education program in order to transfer knowledge about proper land use practices in riparian zones. This campaign would also include encouraging and facilitating active community participation in stream enhancement, such programs as an expanded provincial Adopt-a-Stream program and by exploring the possibility of community based watershed management.

organization is raised through the maintenance of a business office, development of plans, and publication of yearly reports from 1994 to 1998.

Although the organization does not have any legal authority, non-legal standing is given to the Trout Creek Model Watershed in different ways. Credibility for the Trout Creek Model Watershed comes from the vision created as an outcome of the 1994 assessment. Support for the organization has come from the public, government and industry. This support has been given through active participation, in-kind support and financial contributions which are shown in Table 4.18.

Trout Creek Model Watershed Committee also draws authority and exercises influence on individuals with whom they have worked. An example of this type of authority comes from the agricultural community. Interactions with the farmers typically occur in one of two ways. The farmer either approaches the organization due to a specific problem, or the organization will approach a farmer and offer to help with restoration work. By working with the farmer, the organization may gain his/her confidence, respectability and credibility. In turn, the farmer may tell other individuals about the results obtained through working with the Trout Creek Model Watershed Committee.

The organization also exerts influence by working with individuals, organizations and agencies rather than being confrontational. This practice logically follows the manner in which the organization has used to build credibility in the community. Trout Creek Model Watershed would, however, seek regulatory authority through its member's affiliation if an environmental infraction was occurring. Enforcement is difficult since many practices which are not environmentally sensitive have been ongoing for some time, such as the spreading of manure in winter. The Trout Creek Model Watershed Committee exerts influence through working with people in the hope for meaningful change.

Structure

The internal structure of the Trout Creek Model Watershed Committee begins with a committee. The committee is made up of thirteen equal partners which attend meetings.

Table 4.18. Contributions made to the Trout Creek Model Watershed

Type of Contribution	Contributor
Financial Contributions	<p>Canada/New Brunswick COOPERATION Agreement on Recreational Fisheries</p> <p>Department of Fisheries and Oceans</p> <p>Environment Canada's Action 21 Program</p> <p>Environmental Trust Fund (Provincial)</p> <p>Fundy Model Forest</p> <p>Potash Corporation of Saskatchewan</p> <p>Sussex Fish and Game Association</p> <p>Kings County Soil and Crop Improvement Association</p>
In-kind	<p>Canadian Forest Service</p> <p>New Brunswick Department of Agriculture</p> <p>New Brunswick Department of Natural Resource and Energy</p> <p>New Brunswick Department of the Environment</p> <p>Department of Fisheries and Oceans</p> <p>J.D. Irving Limited</p> <p>Many Landover</p>

The committee has a chairperson and a full time coordinator's position. The chairperson was invited by the Federal Department of Fisheries and Ocean to chair the process as it formed in the fall of 1994. The coordinator was hired by a sub-committee made up of committee members and reports to the chairperson. In addition, there are thirteen seasonal field "crew" positions whom are hired by the coordinator. The field crew works on projects planned by the coordinator and chairperson, under the general direction of the entire committee. The arrangement of these positions may be seen in Figure 4.3.

External relations are fostered in two ways. The first way is through the coordinator. The coordinator is constantly interacting with individuals, organizations, and agencies through the responsibilities of the office operation, public awareness and education programs. The second way that the internal structure is linked to the outside is through the members of the organization.

The external structure of the Trout Creek Model Watershed Committee supports the administrative and organizational workings of the organization. When assembling the membership (Table 4.14) of the Trout Creek Model Watershed Committee, linkages of the Trout Creek Model Watershed Committee to their respective organizations was considered. The external structure encompasses government, non-governmental, and community agencies. Each external agency supports the organization by participating in the general membership committee (Table 4.14). These organizations also contribute letters of support towards the application for funding by the Trout Creek Model Watershed Committee. Some groups external to the organization also make additional contributions. For example, the Canadian Forest Service provides office space. The Sussex Fish and Game Association also provides additional in-kind and financial support from fund-raising events. Some organizations make direct financial contributions, such as the Soil and Crop Improvement Association and the Sussex Corner Council.

Linkages have also been formed with other organizations which are not part of the Trout Creek Model Watershed Committee general membership. The Trout Creek Model

Figure 4.3 The Internal Structure of Trout Creek Model Watershed

Watershed Committee works in conjunction with the University of New Brunswick Biology Department and the Fundy Model Forest on joint initiatives such as stream restoration projects. Linkages have also been formed with other community-based groups, such as the Hammond River Association.

Roles and Responsibility

The Trout Creek Model Watershed Committee has defined its role from the Kennebecasis River Habitat Project which was completed in 1994 by the Kennebecasis sub-watershed committee. Groups that began to address the recommendations of this report included: the Fundy Model Forest, Universite de Moncton, Sussex Fish and Game and the Agriculture Best Management Practices Committee. Recognizing the overlap in role between the groups, the Trout Creek Model Watershed Committee was formed as a non-profit organization to:

Develop and implement a methodology for watershed protection and stream enhancement using the Trout Creek watershed as a model. The objectives of the Trout Creek Model Watershed project are: to develop and implement cost effective techniques for the improvement and protection of salmonid habitat, land preservation, the improvement of water quality, and to increase public awareness of the importance of riparian and stream habitat (1996, p. 3).

The responsibilities of the organization are outlined in the overall strategic plan which is shown in Table 4.16. In short, Trout Creek Model Watershed is responsible for: following the recommendations made in the 1994 habitat assessment; using the Trout Creek watershed as a model to show results; carry out in-stream, riparian and land rehabilitation work; and implement public relations/school education campaigns to transfer knowledge.

Within the internal structure of the organization, the role and responsibility of each position may be seen in Table 4.19.

Processes and Mechanisms

The Trout Creek Model Watershed Committee uses different processes and mechanisms to facilitate stakeholder participation in its organizational affairs. The primary process through which stakeholders are involved is through the general membership

Table 4.19 Roles and Responsibilities of Stakeholders in TCMW

Position	Role and Responsibility in Organization
General Membership	The role of the general membership committee is to guide the direction of the organization. The responsibility of the general membership committee is to act in a consultative role by providing input to the chairperson and coordinator.
Chairperson	The role of the chairperson is to chair the organization's meetings. The chairperson is responsible for ensuring that organizational meetings cover all items on the agenda and proceed in an orderly fashion. It is also the responsibility of the chairperson to work with the coordinator in operationalizing, planning and implementing the organization's vision.
Coordinator	The role of the coordinator is to personalize the general direction provided by the membership committee. The coordinator is responsible for planning, organizing, implementing, monitoring, and evaluating the workings of the organization. More specifically, the coordinator is responsible for key duties. In the winter, the coordinator is responsible for planning the activities that the organization will undertake in the upcoming field season. At this time the coordinator is also responsible for implementing educational programs in local schools and all public relation functions. The financial responsibilities of the coordinator are also undertaken. The coordinator prepares and submits proposals for funding. Preparation of the budget is completed. Financial duties which extend throughout the year include: controlling spending, keeping records of all transaction, conducting payroll for staff, and preparing an audit of the organization. The coordinator is responsible for staffing. Duties include: the planning of activities, the hiring of staff, the organizing of staff, the monitoring of actions and, if necessary, the firing of staff. The coordinator is also responsible for leading these activities while training the staff. Any problems which occur within the organization during daily functioning is the responsibility of the coordinator. The coordinator is also responsible for dealing with the logistics of meetings, preparation of the agenda, and taking of minutes. At the end of each year the coordinator prepares a report that details the activities of the organization during the past year.
Staff/Crew	The role of the staff or crew is to carry out the actions prescribed by the coordinator. The responsibility of these people depends on the task assigned. Responsibilities have included: installing stream enhancement structures, erecting fencing, planting seedlings, taking part in yearly monitoring surveys (electrofencing, redd counts, water quality sampling etc.) and working at the fish counting fence.

committee. Stakeholders were originally part of two partnership agreements. The Federal Department of Fisheries and Oceans, who was consulted by both groups, suggested an amalgamation. They also approached Dean Toole to act as chairperson for this combined group. Stakeholder participation is encouraged from involvement with the general membership committee.

Different types of decision making processes exist within the organization depending on the nature and scope of the decision. Decisions which affect the direction of the organization are made by all partners of the general membership committee. These decisions are made at organizational meetings by consensus. A topic is raised by the chairperson and all individuals present must agree on the decision prior to it being accepted. If consensus cannot be reached the topic is discussed at length until everyone is comfortable with the decision. Otherwise the decision is passed over until such a time when everyone is comfortable. Decisions which make the general direction of the organization operational are reached by the chairperson and the coordinator and subsequently are presented to the general membership for input. The work plan is also devised by the chairperson and the coordinator. All decisions which involve the daily running of the office are made by the coordinator as are staffing decisions.

Within the organization, the process of planning follows the strategic plan (Table 4.16) which was based on the goals and objectives formulated by the partners. Using this as a general guide, planning is achieved through consensus between the chairperson and the coordinator. These individuals take ideas to the committee where they are discussed and the ultimate decision regarding organizational direction is achieved. These broad plans form the basis for funding proposals. The work plan for the organization is arrived at by the chairperson and coordinator and corresponds to the monetary resources available.

The budget mechanism is operated by the coordinator. Included in this mechanism is making applications for funding, general accounting duties, preparation of financial statements, payroll duties, and preparing all necessary materials for the auditing process.

The process of monitoring within the organization is not formalized. It occurs primarily through the coordinator as he/she is responsible for the day to day operations and the staff. The chairperson also has a responsibility to the partners in the organization to monitor projects and other aspects of the site.

Organizational Culture

Generally, members of Trout Creek Model Watershed Committee all have the common value of long term improvement in the Kennebecasis Watershed through the use of the Trout Creek Watershed as a model. The common values of all partners involved are reflected in the goals, objectives, and strategic plan which have been previously outlined.

Stakeholders within the organization believe that by working as partners their common values may be achieved. Additional partners, such as the New Brunswick Department of Transportation are sought out as necessary. The public information campaign, undertaken in 1996-1997 alerted a number of local people to the organization and their intentions. Guests are welcomed as all meetings have an open format.

Leadership in the organization comes from the chairperson. Dean Toole, a lead member of the Sussex Fish and Game Association, was approached by the Federal Department of Fisheries and Oceans to serve in this capacity. The chairperson is a well known community member, has served in other community-based initiatives, and has a strong technical background. In addition, the chairperson exhibits good rapport with all of the partners in the organization and maintains good working relationships with support organizations. Stakeholders also perceive that the coordinator will take a lead role. The coordinator works closely with the chairperson in presenting ideas to the committee, planning projects, and developing work-plans. The coordinator takes a lead role in the writing of proposals and final reports.

Although leadership is to come from the chairperson and coordinator, individual's attitudes reflect a partnership approach. Since each partner brings an area of expertise to the committee, members make different contributions as appropriate. All members' expertise,

or lack thereof, is respected and participation is encouraged through understanding. Overall, the mood and format of the organization is “up-beat” and informal.

The organizational culture is defined by the perception and attitude of the partners which constitute Trout Creek Model Watershed. It is the perception of these individuals that the organization must be action centred and conduct rehabilitation work. This is unsurprising given the organization’s roots. This emphasis on rehabilitation is reflected in organizational documents, meetings, strategic plans and the organizational language which often involves the technical terminology required in these projects. Partners within the organization are supportive of these initiatives and the culture of the organization is built around the formation of developing a model which may be replicated elsewhere.

Eastern Charlotte Waterways

Background and Legitimization

Eastern Charlotte Waterways (ECW) sphere of interest is in the southwestern region of New Brunswick. This area encompasses seven major watersheds and three islands. The watersheds are: Lepreau, New River, Pocologan, Magaguadavic, L’Etang, Digdegaush and Beaver Harbour/Pennfield. The islands are: Grand Manan, Deer Island and Campobello Island. Since many of these watersheds are coastal in nature, the estuarine areas they support are of great importance and have been a source of traditional activities in the local area such as fishing.

The industrial profile of the area accentuates the reliance of the industries on natural resources. Forestry, mining, fishing and small agricultural operations form the base of the economy. These operations are now experiencing the affects of years of environmentally unsustainable management. In the area of Eastern Charlotte, deforestation has occurred, mining has ceased, agriculture has declined and the traditional fishery has been reduced with the closure of clam and scallop beds due to effluent (ECW, 1997).

Other industries have moved into the area of Eastern Charlotte. There are 94 aquaculture sites in Charlotte County which have "... been a significant source of income for a county with, at one time, the highest rate of social assistance per capita" (ECW, 1997, p. 16). In conjunction with the aquaculture industry have come fish processing plants. Another expanding industry has been tourism. Specifically, the advent of eco-tourism in the area has brought many new businesses to Charlotte County.

Concern about the environmental quality prompted citizens within the town of St. George and the surrounding areas to work with the Community Futures program of the Charlotte County Economic Development Corporation in developing the proposal document necessary to justify an Atlantic Coastal Action Program (ACAP) site in the area. The justification for an ACAP site specifically focused on environmental degradation that had taken place and the potential for future impacts on the L'Etang estuary. The L'Etang estuary was a focal point because of its importance to the local economy as an area of traditional fishing, mining, and pulp and paper production. Within the estuary area is one of the largest aquaculture industries in the Maritime Region. The greatest perceived threat to this area and industry was pollution. The Lake Utopia Paper mill is also located within the boundary of the estuary. The estuary was a concern for the local community because it would eventually have a negative impact on both the local environment and economy.

The Federal Department of the Environment (Environment Canada) which administers the Atlantic Coastal Action Plan, accepted the site justification document in 1993. After the justification document was accepted, a group of people put together a list of stakeholders which included industry, businesses, governments and community. From this list, stakeholders were contacted by telephone and asked to come to the first meeting. At this meeting the purpose of the organization was revealed. The invited groups were then asked to comment on the presentation and asked if they would like to be nominated to the board.

In 1993, six months after the initial Atlantic Coastal Action Program funding was in place from Environment Canada, Eastern Charlotte Waterways became an incorporated entity.

The forming committee first established a board. This board was comprised of no fewer than 20 individuals that represented many local areas, as shown in Table 4.20. This board then put forth nominations for an executive. The first executive was formed in 1993. The board then hired Thomas Clark as an executive coordinator and Loretta Tatton as an assistant. An office was established at four Main Street, St. George. The executive director began to write By-Laws (terms of reference) for the organization. Based on the aforementioned terms of reference, a board of directors was established.

Eastern Charlotte Waterways was established as a “multi-stakeholder, not-for-profit, community based organization” (1997, p.2). The organization’s sphere of interest includes from the west bank of the Digdegaush river to the east bank of the Lepreau river and all watersheds within. The purpose of the organization was outlined in the By-Laws of The Eastern Charlotte Waterways (1994) section 4.1.1 and 4.1.2.

Section 4.1.1 - To enable persons, associations and communities of southwestern New Brunswick to participate in the development and implementation of a comprehensive environment management plan for any of the waterways, watersheds of particular waterways, and general bodies of water, including the coastal waters and estuaries, found within the coastal area of the Bay of Fundy extending from the west bank of the Digdegaush River to the east bank of the Lepreau River.

Section 4.2.1 - To provide the infrastructure and system by which persons, associations and communities of south-western New Brunswick can develop and implement a comprehensive environmental management plan for any of the waterways, watersheds or particular waterways, and general bodies of water, including the coastal waters and estuaries within the area described in 4.1.1 hereof.

The general purpose of the organization is to “provide the forum in which community can, while working with government and industry – access, review and implement what is necessary to ensure the sustainable development of our natural resources and the communities that rely upon them” (1997, exec summary). The mandate of the organization was to write an environmental assessment followed by a comprehensive environmental management plan. By completing an assessment, it was Eastern Charlotte Waterways’ goal to identify issues and recommend remedial actions. The comprehensive environment management plan then

Table 4.20. The Board of Directors for Eastern Charlotte Waterways

Area	Organization
Watershed / Communities	
Lepreau	Lepreau LSD
New River	Local Community Group
Pocologan	Pocologan Interested Parents Association
Pennfield	Pennfield LSD
Beaver Harbour	Beaver Harbour LSD
L'Etang	Fundy Bay LSD
Magaguadavic	Magaguadavic Watershed Management Association
Digdegaush	Digdegaush River Bushwalkers
Fundy Isles	West Isles Clean Environmental Association Inc.
Youth	Fundy High School
Aquaculture	N.B. Salmon Growers Association
Commercial Fishermen	Fundy Weir Fishermen's Association Fundy North Fishermen's Association Lepreau Clam Digger's Association
Manufacturing / Processing	Connor's Brothers LTD. Lake Utopia Paper LTD. C.E.P. (LUP Paperworkers)
Business	Eastern Charlotte Chamber of Commerce
Municipal	Blacks Harbour Village Council St. George Town Council
Community Members	Seven (7) Members at Large

was to address long term rectification of problems of Eastern Charlotte. In addition to conducting an environmental assessment, it was also the aim of Eastern Charlotte Waterways to “increase public awareness and, subsequently, involvement and participation” (1997, p. 2).

With the aforementioned purpose in mind, Eastern Charlotte Waterways became a functioning organization in 1994. The initial thrust of Eastern Charlotte Waterways was to garner community participation and begin the environmental assessment. The focus of this initial assessment was on the L’Etang estuary. Efforts to gain community participation during this time included hosting a weekend workshop to develop a vision statement and having volunteers conduct water quality analysis. A shellfish valuation guide was also written.

Although some progress had been made by the organization, participation started to wane due to inter-organizational conflict. At the height of this conflict a resolution strategy was attempted with a neutral administrator. The strategy, however, did not work as conflicts were not resolved and interest was not rejuvenated among board members. The executive committee had been reduced to a chair, secretary and a member at large. Further, the executive director resigned for personal reasons.

In December 1996 a change occurred within the organization. A new chairperson and coordinator were hired. The new coordinator set about refurbishing the executive and the board. Concomitantly, the coordinator also created a business office. The original office was transformed by converting storerooms into office space, making window displays and establishing a community resource center.

Once the coordinator refurbished the internal structure of the organization, effort was directed to making the organization working efficiently and effectively. In 1997, Eastern Charlotte Waterways released the document entitled “the Watersheds of Eastern Charlotte: Environmental Quality Assessment.” The document reflects the expanding focus of the organization from solely the L’Etang Estuary to include eleven rivers and streams and four recreational sites. The assessment is “a measurement of the environment’s condition, based

on value judgements and scientific measurements, depending on one's interests and perspective" (1997, p. 1). From the overall environmental assessment, areas of concern were noted and recommendations were made. Furthermore, "all recommendations are based on the vital collaboration of citizen, business and government to ensure the sustained health of these water systems" (1997, exec summary).

Although the production of the environmental assessment was a large undertaking, many other initiatives have been pursued. Many environmental and community issues have been addressed such as tourism, fishing, industry and effluent. In addition to these issues being addressed in the assessment, the environmental and community issues were used as topics for a questionnaire which was distributed to the community. The outcome of these community concerns were briefly introduced in the assessment; final recommendations are to be made in the forthcoming comprehensive environmental management plan. Measurable objectives that have been achieved by Eastern Charlotte Waterways are shown in Table 4.21.

As the organization enters 1998, the immediate priority is to finish the Comprehensive Environmental Management Plan which will summarize where the organization has been and outline future directions. The organization continues to increase its breadth by taking a lead role in the emergency response planning and working with the New Brunswick Department of Environment on water classification. The focus of the organization is also broadening to include other aspects of the environment such as air quality and forest management.

Eastern Charlotte Waterways has no legal authority beyond an incorporated entity. The rationale for the existence of the organization is to provide liaison services between the community and the government. Eastern Charlotte Waterways is now recognized by various groups and agencies for their liaison services. Recognition and support for Eastern Charlotte Waterways is also made through financial and in-kind contributions which may be seen in Table 4.22.

Table 4.21. Initiatives Undertaken By Eastern Charlotte Waterways

Initiative	Description of Initiative
Green Pin Campaign	Pins were developed to promote sustainable development.
Environmental Quality Assessment and Community Profile	Document completed in 1997.
Community Newsletter	The "Coastal Chronicle" is produced biannually and addresses ECW activities and community concerns.
CHS- Marine Chart Distribution Center	The resource center distributes nautical charts and documentation
Aerial Photo and Map Sales Outlet	Aerial photos, topographic maps and community resource mapping are available at the resource center.
Water Classification Program	Water quality analysis and digital map files for the Magaguadavic Watershed as part of New Brunswick water classification.
Shellfish Growing Area Monitoring Program	A link program with Environmental Protection to train staff in Charlotte County.
Swim Watch	A monitoring program which provides analysis of swimming waters for fecal coliforms from June to September.
Water Quality Monitoring	Volunteers released 21 freshwater sites for such parameters as pH, DO and temperature.
Resource Valuation	Document released in 1997 that provided assessment and valuation of a resource. The L'Etang soft shell clam resource was specifically studied.
Environmental Education	Local classes (K-2) are visited twice yearly to introduce them to environmental do's and don'ts.
Community Appreciation Day	An annual day of family fun, sponsored by the community, where Board Members and their families can enjoy themselves.
Beach Sweep	An annual clean up and assessment of the coastal area.
Fundy New Brunswick CAPP Committee	The first "Community Action Partnership Program" established in the Atlantic provinces. It forms interlocking emergency response plans for the coastal zone of New Brunswick.

Table 4.21. Initiatives Undertaken by Eastern Charolette Waterways (continued)

Type of Contribution	Contributing Organization
Financial Contribution	Fundy Community Foundations Lake Utopia Paper LTD Environmental Trust Fund (Provincial) Environment Canada Groom's Insurance Natural River Cruises Piskahegan River Company Ovenhead Salmon Smokers New River Smokers Magauadavic Salmon Association Country Market Shell Atlantic Silver Aquafish
In-kind Contribution	Image Express Stedmans Hanselpackers Save Easy Black's Harbour Save Easy New Brunswick Department of Supply and Services Connor's Brothers LTD. Irving ALERT NB. Tel. West Isle C.E.A. New Brunswick Department of the Environment L.U. Paper Town of St. George South West Solid West Commission J.D.I. Woodlands

Table 4.22. Contributions to Eastern Charlotte Waterways

Type of Contribution	Contributing Organization
Financial Contribution	Fundy Community Foundations Lake Utopia Paper LTD Environmental Trust Fund (Provincial) Environment Canada Groom's Insurance Natural River Cruises Piskahegan River Company Ovenhead Salmon Smokers New River Smokers Magauadavic Salmon Association Country Market Shell Atlantic Silver Aquafish
In-kind Contribution	Image Express Stedmans Hanselpackers Save Easy Black's Harbour Save Easy New Brunswick Department of Supply and Services Connor's Brothers LTD. Irving ALERT NB. Tel. West Isle C.E.A. New Brunswick Department of the Environment L.U. Paper Town of St. George South West Solid West Commission J.D.I. Woodlands

Eastern Charlotte Waterways is able to use its partnerships to exert influence in two specific ways. The primary manner in which the organization attempts to influence others is through public awareness and education. In this way, Eastern Charlotte Waterways acts as a neutral organization trying to bring about positive environmental change, rather than condemning others practices. If, however, this route fails, the organization raises the profile of the issue and notifies the proper regulatory agencies.

Structure

The internal structure of Eastern Charlotte Waterways is based on a general board of approximately 15 members. Individuals sit on the board in a volunteer, support and advisory capacity. Representing the board is an executive made up of seven positions – chairperson, vice-chairperson, secretary, treasurer, two members at large, and a past chairperson. The board hires two full-time employees. These positions are the executive coordinator and program administrator. The general membership elects a board at the annual general meeting. The board elects the executive committee from their ranks and hires an executive director and project administrator. The remaining individuals in the organization are made up of contract positions. The number of these positions varies depending on funding contracts. The internal structure of Eastern Charlotte Waterways is shown in Figure 4.4.

The interface between the organization and outside affiliations occurs in three ways. First, the executive coordinator and project administrator work with actors and agencies exterior to the organization through many of the initiatives. Second, all board members represent themselves, however, they also may use their connections and professional affiliations to link the organization with others. Individuals from government agencies may serve on the board in an advisory capacity and provide technical assistance. Finally, the presence of an individual that acts as a “window” to Environment Canada provides connections to other agencies.

In addition to the agencies which serve in a supportive capacity on the board, Eastern Charlotte Waterways works with many other community-based groups and citizens. Linkages

Figure 4.4. Internal Structure of Eastern Charlotte Waterways

have been formed with: Magaguadavic Salmon River Association, Atlantic Salmon Federation, West Isles Clean Environment, St. Croix Estuary Project, St. Croix Waterway Commission, St. John ACAP and JDI Woodlot Public Advisory Board. Volunteers are crucial to the continuity of water quality monitoring and beach cleaning activities. During the fall of 1997, 45 people volunteered in beach-sweeping activities.

Roles and Responsibilities

The role of Eastern Charlotte Waterways was articulated well by the chairperson, “to provide guidance and support to diverse groups of stakeholders concerned with environmental and resource management issues in our local area. We provide an avenue for people to share information and resolve resource issues through joint planning and action by consensus” (Joe Hunt, 1997). The role of the organization is also reflected by the statement of purpose. In the assessment document it was written that “Eastern Charlotte Waterways purpose is to provide the forum in which community can, while working with government and industry – assess, review and implement what is necessary to ensure the sustainable development of our natural resources and the communities that rely upon them” (1997, exec summary).

By undertaking the aforementioned role, Eastern Charlotte Waterways has accepted and invited many responsibilities. The primary responsibilities of the organization are to produce an environmental assessment document and comprehensive environmental management plan as described in the terms of reference. In addition, the organization has undertaken responsibilities in a wide range of areas. Responsibilities accepted include: education, water classification, shellfish monitoring, water quality monitoring, emergency response plan, and coastal resource mapping.

Within the organization individual stakeholders have various roles and responsibilities. The roles and responsibilities of stakeholders are shown in Table 4.23.

Process and Mechanisms

Stakeholder participation within Eastern Charlotte Waterways is facilitated through processes and mechanisms. In the terms of reference for the organization, a process for

Table 4.23. Role and Responsibilities of Stakeholders in Eastern Charlotte Waterways

Position	Role and Responsibility in Organization
Board	The role of the board is to guide the overall direction of the organization. The overall responsibility of the board is to be sensitive to community issues and raise issues that require attention. Other responsibilities depend of the capacity to which the individual serves on the board. Individuals that serve in a volunteer capacity act as directors on the board and have the responsibility of voting. Individuals that serve in a support capacity either provide financial or in-kind support. Individuals that serve in an advisory position are responsible for technical support.
	The role of the executive is to represent the interest of the entire board. The executive is responsible for making critical decisions regarding the organization and its' finances. The executive is also responsible for hiring and firing of individuals within the organization. The executive reports to the board as a whole.
Chairperson	The role of the chairperson is to be an authority at organizational meetings. The chairperson is responsible for ensuring that all items on the agenda are followed and that the meeting is conducted in an efficient and orderly manner. They are also responsible for ensuring the executives role is carried out.
Vice-Chairperson	The role and responsibilities of the vice-chairperson are identical to the chairperson. The vice-chairperson assumes the responsibilities of the chairperson when he/she is not available.
Secretary	The secretary's role is to deal with correspondence of organizational meetings. The secretary is responsible for taking minutes at organizational meetings.
Treasurer	The role of the treasurer is to be in charge of the organizations money. The treasurer is responsible for overseeing accounting, auditing and financial transactions.
Member at Large	The role of the member at large is to provide direction.
Past Chairperson	The role of the past chairperson is to provide historic support for operational flow.

Table 4.23. Role and Responsibilities of Stakeholder in Eastern Chaolette Waterways
(continued)

Position		Role and Responsibility in Organization
	Coordinator	The role of the Coordinator is to ensure that every other part of the organization works together efficiently. The executive director's main responsibility is to take the community issues that the board identified and to find matching programs for funding. Subsequently, they are also responsible for preparing proposals for funding support to these various funding programs. This includes representing the organization at meetings and networking. The executive director is also responsible for setting up the board meetings and the agenda. Finally, the executive director is responsible for controlling the activities of the organization and overseeing all actions.
	Project Administrator	The project administrator's role is to manage the projects undertaken by the organization. The project administrator is responsible for the budget and to ensure that funding is received to the project to which it is allotted. They are also responsible for monitoring that each project is completed within the allowed time frame and that a final report is given to the Executive Coordinator. In addition, running the front office is also the responsibility of the project administrator.
	Contract	The role and responsibility of individuals in contract position depends on the terms of the agreement. For example, individuals in contract positions have been responsible for: developing water classification, organizing a resource library, writing a contingency plan for emergency response, developing a monitoring program for shellfish, counting wild salmon at the Magaguadavic fishway and conducting shoreline assessment.

stakeholder membership on the board was developed. Stakeholders were to include citizens and representatives from the natural, social and economic environments. Membership to the board is open to all who agree to support the aims and objectives of the organization. Processes are also included in the terms of reference that outline how membership may be revoked. All members may be elected to the board of directors which occurs at the annual general meeting.

A mechanism is in place that ensures the board is comprised of at least 20 members representing the areas shown in Table 4.20. Although membership is open to all, federal and provincial departments are limited to ex-officio capacity and for technical advice. Therefore, all voting board members in the organization are non-government.

Mechanisms are also in place to facilitate the decision making process within the organization. Decisions that are required for the daily office functions and programs are made by the executive director and project administrator. Decisions that are required at a organizational level are made either by the executive committee or the entire board. In the terms of reference a mechanism for decision making is outlined which stipulated that “decisions at all meetings shall be reached by consensus” (1997, 9.6). It continues, that if consensus is unclear the issue would be held over until the next meeting. If an issue is still unclear a vote of majority rules. If a meeting cannot be called, a quorum by a number of board and/or executive members is required for a decision to be valid. Employed staff are not eligible to vote.

Mechanisms are also in place that a quorum must be established before business may take place. A quorum is established for the general membership when 20 members are present; the board of directors when eight directors are present, and for the executive committee when four executive committee members are present.

The vision statement and purpose provide a framework for organizational direction. The impetus for many ideas undertaken come from the staff. These ideas are often presented to the board which is responsible to give direction on behalf of the general membership. The staff takes this general direction and moulds it into a plan which they are then responsible for

implementing. Evaluation of the staff occurs each year by the chairperson. Monitoring and public input is incorporated into the planning process through the staff dealing with community concerns and specifically, the project administrator.

A budget mechanism is also in place which is the responsibility of the treasurer. The terms of reference, section 10, specifically outlines the ways in which the finances of the organization are to be conducted. Included are: borrowing, signing officers, financial review and the conduct of receiving funds.

Organizational Culture

Although membership is open to all individuals, the terms of reference stipulate that all members must agree to and support the aims and objectives of Eastern Charlotte Waterways. Therefore, all members of the organization are committed to the values reflected in the mission statement and purpose of the organization. These values are outlined in Eastern Charlotte Waterway's mission statement, to "envision waterway communities in Eastern Charlotte, that value, foster and protect their diverse traditional and historical resources ... community awareness and participation which will promote viable means to the safe, accountable management and development of the environment" (1997, p. 2).

The common values bring stakeholders together in the organization and the member's perceptions and attitudes define the present organizational culture. The perceptions and attitude of the staff are congruent about the direction of the organization. Although the board remains the overall governing body, they are supportive of the coordinator and project administer. A leadership role is taken by the coordinator, but in a consultative manner. Ideas, plans, and proposals are brought to the board by the coordinator. The board and the coordinator communicate well. The board relies on the staff because they are close to the projects and constantly in touch with the community.

The attitudes of the stakeholders reflect the importance of community. A technical language does not predominate the organization, although technical issues are dealt with. As organizational members have their own area of expertise or have learned about, for example,

water analysis, they share this information with others. The culture of the organization is, thereby, educational in nature.

Evaluation and monitoring occur in the organization by the board. Specifically, the chairperson of the board conducts an evaluation of staff. Within the internal structure of the organization, monitoring for specific programs is conducted by the project administrator. The workings of the site are monitored by the executive coordinator. Overall, the organization is monitored by Environment Canada to ensure that an environmental assessment and comprehensive environmental management plan are completed.

St. John River Society

Background and Legitimization

The St. John River covers a large geographical area from the upland regions in Maine and Quebec through to the Bay of Fundy. The river is one of the longest in eastern North America meandering a total of 720 kilometres before emptying into the Atlantic Ocean at the city of Saint John (St. John River Society, 1994). The river drains a basin area of 55,000 square kilometres, the largest drainage basin in the province of New Brunswick (St. John River Society, 1994). Communities, towns and cities are scattered along the distance of the river. The river has been used for recreational boating, sailing and primarily for energy production through the creation of ten hydroelectric dams (St. John River Society, 1994).

The St. John River Society was spawned from social origins. David Folster, Daniel Gleason, Harold Hatheway and David Olmstead had gathered for dinner. While subsequently viewing the St. John River these individuals felt that a need existed to form a friends of the river organization. The impetus for such an organization came from the perception that little was being done with a focus on the entire watershed. Upon formation, the focus of the Society reflected the founders interests in history and stewardship. The initial board was formed by the four founding individuals. The individuals that constituted the first board and their affiliations are shown in Table 4.24. The membership of the organization was small

with approximately 20 members. These members were recruited primarily through word of mouth from the founding members. At this early stage, the Society's main activity was the production of a newsletter about the river.

Table 4.24. Original Members of the St. John River Society

Name	Organizational Affiliation	Location of Residence	Sector
David Folster	Writer	Fredericton	Other
Harold Hatheway	Writer	Fredericton	Other
David Olmstead	Lawyer	Fredericton	Business
Daniel Gleason	University of New Brunswick	Fredericton	Education

After the organization had begun to function, the initial board members went about recruiting members. This was carried out in many ways. For example, a personal ad was placed in the *Globe and Mail* that asked for "Lovers of the River." Board members also continued to use their contacts to build the membership of the society. The membership of the organization continued to grow and reached 250 individuals in 1995. At this time, board membership contained individuals throughout the watershed.

In 1995, the organization declined from a peak membership of 250 members to approximately 150 members. Some of this decline was due to many gift memberships not being renewed. The board which had provided the initial impetus for the St. John River Society had also begun to "run out of steam" and no new board members were willing to take their place. Generally, the organization was not active during this period and the publication of the quarterly newsletter was suspended for eight months.

In 1996, the organization came back, despite the loss in members. The board was rebuilt with a broader base. This was accomplished through using the existing network of

board members. The present board members now draw upon a broader geographical base as may be seen in Table 4.25. Accompanying this increased breadth in the board were changes in the executive of the organization. Muriel MacKenzie became the new president of the organization. A new position of past-president was also created to maintain linkages with previous efforts. The voluntary nature of the organization remained intact.

Since 1996, the organization regained much of its earlier momentum and has broadened its interests. The current membership totals 150 individuals. A majority of these individuals are from the watershed. The board is constituted by the broad range of these individuals and their geographic distribution throughout the watershed. While the St. John River Society has maintained their original historical focus, it has continued to broaden its sphere of interest. Since 1995, the organization has directed attention toward stewardship and environmental aspects of the river. In the past two years, a university student with an environmental science background worked to develop and implement an awareness program targeted at waste disposal and boating. All activities of the St. John River Society are shown in Table 4.26.

In an effort to concentrate more on the environmental aspects of the river, the organization has acted as a participant in the formation the Lower Saint John Sustainable Development Project. This is seen by the St. John River Society as a way to maintain the critical mass necessary for river stewardship.

The St. John River Society maintains the legal standing of an incorporated entity. This was undertaken by the first directors in 1993. In addition to the organization being an incorporated entity, By-Laws were also formed to govern the Society.

Non-legal standing comes from the organization's rationale for existing, credibility and ability to influence others. The rationale for the organization's existence comes from its members. The members believe that the provision of a strong voice for the river is necessary.

In representing the river, credibility is given to the organization in various ways. First, credibility is given to the organization by the members. Many of these members are politically active and, thereby, lend credibility to the organization. Second, credibility comes

Table 4.25. Present Board Members of the St. John River Society

Name	Organizational Affiliation	Location of Residence	Sector
Doris Calder	Historian/Writer	Clifton Royal, NB	Other
David Folster	Writer/Exec. Director, Tree House	Fredericton, NB	Other
Carolyn Cole	Exec. Director, ABEC	St. John, NB	Other
Don Cyr	Teacher/Historian	Lille, Me.	Education
Richard Gorham	Pres. of N.B. Human Rights Commission	Clifton Royal, NB	Other
Georgie Day	Provincial MLA	Hampton, NB	Political
Will Haggart	Biologist	Burtt's Corner, NB	Environment
Gordon Fairweather	Lawyer	Rothsay, NB	Business
John Lang	Teacher/Historian	Perth-Andover, NB	Education
Frank Lipsett	Teacher/Historian	Woodstock, NB	Education
David Olmstead	Provincial MLA	Burtt's Corner, NB	Political
Muriel MacKenzie	Business Owner/Conservationist	Islandview, NB	Business
Kathryn Olmstead	Teacher/Publisher	Caribou, Me.	Education
Bill Miller	Canoe Builder	Plaster Rock, NB	Business
Clair Ripley	Retired Business Owner	Hampsted, NB	Other
Larry Morris	Rep. Quebec Labrador Foundation	Ipswich, MA.	Other
Cathy Pelltier	Writer	Caribou, Me.	Other
Lane MacIntosh	Writer, Communications N.B.	Fredericton, NB	Other
Lynn Tompkins		Fredericton, NB	
Ann Brennan	Business Owner/Conservationist	Perth Andover, NB	Business

Table 4.26. Activities Undertaken by the St. John River Society

Activity Undertaken	Brief Description
Concert	The Society annually hosts a concert known as "River Rhythms" in Fredericton. At least one of each performer's songs must be about the river.
Mixing of the Waters	Water is taken from different parts of the watershed and mixed in an annual ceremony.
Waste Water Project	An information campaign was undertaken to educate boaters on the St. John River about environmentally sensitive waste disposal.
Art/Photo Competition	The photo contest was held featuring the St. John River.
Map Distribution	The Society produced a wall map entitled, The St. John: Portrait of a River. The maps were distributed to villages in the watershed.
Newsletter	A quarterly newsletter, The River, is the official publication of the St. John River Society. It deals with issues of interest to members and the Society's undertakings.
Church Bell-Ringing Project	An annual ringing of the bells is undertaken each year on 24 June at 12:15 p.m. ADT (11:15a.m.)EDT.
Project Enterprise Project	A workshop was held for interested teachers in the Fredericton area to develop a curriculum kit to supplement the map distributed to schools.
Riverbank Litter Frolic Project	The Society solicited help throughout the watershed to clean the banks of the river.

from other organizations that the St. John River Society works with such as in the Lower St. John River Coalition. Third, contributions by agencies and actors provide legitimization. Contributors, their sector affiliation and the type of contributions made are shown in Table 4.27. Finally, the organization is recognized as a historical authority on the topic of the St. John River.

Table 4.27. Contributions to the St. John River Society

Contributor	Sector	Type of Contribution
New Brunswick Government (Environmental Trust Fund)	(Public)	Financial
N.B. Power	(Public)	Financial
McCain's Limited	Business (Private)	Financial
McKay Foundation	Other (Private)	Financial
Ste. Anne Nackawick, Pulp and Paper Ltd.	Forestry, Industry (Private)	Financial
Kiers Communication Inc.	Business (Private)	Financial
Various Members	(Private)	In-kind

The organization exerts an influence in two ways. First, influence is exerted through its members. Second, the St. John River Society acts as a lobbying organization. For example, the St. John River Society is in the process of lobbying the government for stricter regulations for boating on the St. John River. Since they are recognized as a “voice of the river” and represent their membership of 150 individuals from within the watershed they are viewed by politicians and their own members as an advocacy group. Through the quarterly newsletter and bi-monthly magazine issues it is the desire that concern may be raised and support by membership gained.

Structure

The internal structure of the St. John River Society is built around a board consisting of approximately 30 individuals. From the board, an executive is chosen through a nomination

process. The executive includes the: president, past-president, vice-president of the upper and lower river, treasurer, and secretary. Subsequent committees may be formed within the executive and from the membership as necessary. All positions, with the exception of summer interns, are volunteer in nature. The internal structure of the organization may be seen in Figure 4.5.

The interface between the organization and other groups occurs through the executive and board members. For example, the organization is represented by the president and past-president at functions which pertain to the St. John River Society. The Society is also making a concerted effort to forge linkages with other organizations concerned with water management, particularly within the St. John watershed.

Links with other organizations have stemmed from joint projects and guest invitations. For example, the generation of educational materials and formulation of a map were financially supported by the Gulf of Maine Council and the Environmental Trust Fund. Agencies such as the Provincial Department of the Environment have been invited to speak at the annual general meetings.

Roles and Responsibility

The role of the St. John River Society was defined by the founding four members and states that it exists to “celebrate life in the St. John River watershed, to foster an appreciation of the river and its tributaries as an important and unique bioregion and to stimulate and nurture such projects as help to achieve those ends” (St. John River Society, 1992, p.2).

Responsibilities of the St. John River Society were outlined in the letters patent. These include: educating the public regarding geography, history and architecture; protecting and enhancing the ecological, historic, cultural and recreational resources; and promoting research in the subjects of natural beauty and historical importance (St. John River Society, 1992). Generally, responsibilities undertaken thus far have been of a historical nature. The organization has been moving in the direction of undertaking more responsibility for ecological stewardship through initiatives such as the boat tank issue.

Table 4.5 The Internal Structure of the St. John River Society

Within the internal structure of the organization, the role and responsibility of each position may be seen in Table 4.28.

Processes and Mechanisms

The St. John River Society uses various processes and mechanisms to facilitate stakeholder participation in the organization. Recruitment of general membership occurs primarily through word of mouth, although processes are in place to garner new members. These processes have included the distribution of pamphlets, mail-outs and the quarterly newsletter.

The decision making process follows the By-Laws of the organization. Decisions regarding the general direction of the organization are made by the board of directors by rule of the majority. Decisions required to implement the activities of the organization are made by the officers who form the executive committee. The executive committee can make any decisions they perceive to be in the best interest of the organization. These decisions are made by polling the organization. A mechanism is in place that any decisions made by the committee must be reported to the board, which has the capacity to reverse the decision. The process of daily decision making may be delegated to an executive director. Since the position does not presently exist, the president and past-president make the daily decisions of the organization.

Planning follows a similar process. The general direction for the organization comes from the responsibilities outlined in the letters patent and the board. The executive committee details the planning process and forms committees as required to implement actions.

The budget process is the responsibility of the treasurer. The president and board of directors are responsible for dispersing the monies as they deem appropriate through the decision making-process. The budget process, however, does not play an important role in the organization since the financial resources of the volunteer organization are limited.

Generally, the process of monitoring occurs informally through the executive committee. In particular, it is the president and past-president that ensure the various

Table 4.28. Roles and Responsibilities of Stakeholder in the St. John River Society

Position		Role and Responsibility Within the Organization
Members		Generally, it is the role of the members to support the undertakings of the St. John River Society. The responsibilities of the membership depends on class. Individual members, corporate members and honorary life members may all vote on issues which pertain to the society and elect members from within their ranks to the board of directors. Associate members also support the organization, but do not receive a vote.
Board of Directors		The role of the Board of Directors is to manage the affairs of the Society. It is the responsibility of the Board of Directors to guide the actions of the society. It is also the responsibility of the board to elect the officers of the Society.
	President	The role of the president is to be the chief executive officer of the Society. The responsibilities of the president are to preside at the meetings, have general charge of all activities and see that all resolutions are put into action. The president also acts as a signing officer for the Society and is responsible for any other duties deemed appropriate by the board.
	Vice-President (North and South)	The role of each vice-president is to provide leadership in each portion of the river (North and South). If the president is unable to perform their responsibilities the vice-president assumes their responsibilities. Other duties may be assigned by the board or the president.
	Past President	The role of the past president is to provide expertise and maintain links to the previous executive. It is the primary responsibility of the past president to assist the president. Other duties may be assigned by the board or president.
	Treasurer	The role of the treasurer is to have charge of all funds and securities of the Society. The responsibilities of the treasurer is to keep books, prepare and present financial statement and other duties as assigned.
	Secretary	The role of the secretary is one of correspondence and record keeping. The responsibilities of the secretary include: taking minutes; alerting members to meetings; keeping track of membership; and keeps the corporate seal.

responsibilities of the organization are performed. The process of monitoring activities occurs in an informal manner, although monitoring the performance of individuals were written in the By-Laws. Formal mechanisms are also in place to remove individuals from office with an affirmative vote of the board if cause is warranted.

Organizational Culture

Generally, it is the common values, attitudes, and perceptions of St. John River Society's members which define the organizational culture. The founding members of the organization held a deep and abiding love of the river. It was the attitude of these individuals that the St. John River required a voice to raise public awareness. Upon formation of the organization, others could join as a member and express similar values.

It was the perception that the organization should have an historical focus and be social in nature. This focus came from the initial members and was reflected through many of the initiatives which the organization has been and continues to be involved with. Both leadership and labour also came from the founding members. The present structure was adopted to broaden geographical representation and reduce the demands on any one individual. The past president's position was created to retain links with the previous structure and to support the shift in leadership.

Under the new institutional arrangements, the values, attitudes, and perceptions have broadened to include more ecological issues. Meetings remain structured according to the By-Laws and are social in nature with guests and anecdotal stories. All stakeholders are committed to the organization's purpose and maintain good rapport with the president. Although the structure and leadership of the organization has changed, much direction and energy remains vested in the original core group of individuals. It is the perception of organizational members that the executive, plan and implement the activities of the organization. Ultimately, it is the president and past-president who plan and implement many of the initiatives.

CHAPTER FIVE

ANALYSIS

Case Analysis

The goal of analysis was to gauge characteristics exhibited by each organization which are symptomatic of integration. The results of each case, as presented in Chapter Four, were examined with reference to the theoretical framework. Under each organizational element, a pattern matching mode of analysis was used. Characteristics were qualitatively judged to be exhibited at three intensities based on how well the exhibited characteristics (results) matched the reliable symptoms for each indicator of integration. If the characteristics exhibited by the case matched the reliable symptoms for the particular indicator of integration, the case was qualitatively judged to strongly (+) exhibit the characteristic symptomatic of integration. If the characteristics exhibited by the case matched some of the reliable symptoms for the particular indicator, the case was qualitatively judged to moderately (•) exhibit the characteristic symptomatic of integration. If the characteristic exhibited by the case matched few of the reliable symptoms for the particular indicator of integration, the case was qualitatively judged to weakly (-) exhibit the characteristic symptomatic of integration. As an outcome of following the theoretical framework, a profile of characteristics symptomatic of integration was developed for each case. These profiles form the basis for the cross-case analysis undertaken later in this chapter.

Miramichi River Environmental Assessment Committee

Components

As a reflection of managing in accordance with the components of integration, MREAC gives consideration to diverse values and inputs of both agencies and private interests in a shared and coordinated manner. Goals and objectives that emphasize forethought to environmental integrity and acknowledge quality of life are shared between most resource

sectors. The presence of sector blending, within the membership, was initiated by a core group of individuals. Sector blending was further developed through an understanding reached between MREAC and various agencies at a one day workshop in December of 1993. As a result, sector blending has been maintained throughout the organizational elements. There is no mandate, however, for sector blending in the By-Laws of the organization. Linkages and participation in the roles and responsibilities by the agencies and actors provide MREAC with an external support structure and contribute to legitimization. Legitimization is further facilitated by the internal structure of the organization and the strategic nature of the planning process. Decisions are made in the planning process and throughout the organization by consensus. General agreement and information sharing appear to predominate the attitudes and values of the stakeholders within the organization both past and present.

Strategies

It was determined through conducting this research that MREAC exhibits characteristics symptomatic of an integrated approach. By implementing integrated resource strategies the organization uses planning as a base for other management functions to achieve their objectives. In the roots of the organization, planning was prioritized and focused on issues and items that pertained to the health of the Miramichi Watershed. Priority was given to this through open participation and soliciting public input into the planning process which in turn increased public awareness and education. Although the planning process is open to all, it is the internal structure of the organization that drives the planning process. The executive, elected by the membership, provides general guides to the executive director. It is the executive director who synthesizes all input and works with the executive to produce the plan which the organization will follow. Although public input constitutes an important part of the planning process, it is important to ensure that sectoral representation and balance is maintained. ADL Nolan Davis, was contracted to write the MREAC Action Plan (1992) based on interviews from different sectors. By examining the affiliation of interview participants, it was evident that government involvement was five times that of any other

sector. Plans that enhance the non-legal status of the organization are action oriented and capacity building as they are developed with MREAC's implementation capabilities in mind.

The planning of the organization provides a basis for the structure, stakeholder participation and decision-making. The internal structure of the organization is relatively flat with short chains of command. It is clear that the executive director of the organization is to provide leadership, managerial expertise and motivation. Although leadership and motivation may also come from the elected chairman, it is the perception and attitude of stakeholders that the executive director is responsible for the general workings of the organization. Other stakeholder participation is encouraged by the executive director and occurs interactively. All decisions that affect the entire organization are made by consensus. It is a combination of this interactive decision-making process and the leadership of the organization that flexibility and adaptability is maintained in the organization.

As the organization has matured, it has endured a change in leadership. Considering the diverse values held by stakeholders, it is expected that many viewpoints would change as the organization evolved. The perspective of the organization, however, has not changed. MREAC has been dominated by a technical perspective. Although other secondary perspectives are evident, the technical perspective serves to accommodate the diversity of values and perceptions of the participants.

Values

Results of this research indicate that MREAC generally considers the full range of resource values associated with water. When the organization began, members were particularly concerned about the state of the environment. This has continued to be the common bond that holds the organization members together. Establishing credibility for the organization was important to stakeholders. Increasing public awareness and education of environmental issues became foundations to planning within the organization. The organization and its membership perceived that establishing a basis in the regulation and public awareness/education functions was crucial.

Although MREAC has remained true to its roots, the organization and its participants have remained flexible and adaptive. Recognition of spiritual/historic, cultural/artistic and nature protection issues of the watershed by the stakeholders has prompted the organization to broaden its objectives, planning and actions to include production and carrier functions. Recognition of these functions are clearly secondary to the importance placed on the regulation and information function.

Conclusion

Based on the model used to conduct this research it appears that MREAC exhibits, to varying degrees, the elements necessary to sustainably manage the water resources of the Miramichi watershed. The characteristics symptomatic of integration exhibited by MREAC are summarized in Table 5.1. Judging from the indices of integration, the organization reflects the components considered important to integrated resource management and has undertaken key strategies in their approaches used to operate. More concentration could be put on improving sensitivity to all consequences of action and in strengthening representation in the decision-making strategies. MREAC places particular emphasis on the regulation and information (education and scientific) functions of water. Opportunity exists to increase consideration given to other water values.

Bathurst Sustainable Development Project

Components

The Bathurst Sustainable Development Project, in accordance with the components of integration, entertains the diverse values and inputs of both agencies and private interests. These values and inputs, however, are not allocated in a shared manner. The lack of shared values and inputs were exhibited across all organizational elements, but were most pronounced in the legitimization, structure, and organizational culture elements which are predominated by the public sector. Within the organization, the presence of sector blending was initiated by the public relations officer and is maintained through the necessity of political representation

and the desire to be part of a “successful” process. No mandate exists for sector blending within the organization.

The agencies and actors which have undertaken the roles and responsibilities within the Bathurst Sustainable Development Project have explicitly acknowledged the importance of forethought to environmental integrity and quality of life. Much of the organization’s non-legal standing comes from the Environmental Trust Fund. Although these roles and responsibilities may be explicitly acknowledged, the processes and mechanisms of the organization would indicate that emphasis is placed on environmental issues that pertain to water. The structure of the organization also reflects the emphasis given to environmental issues as the public relations component follows the technical component and the site coordinator is hired due to a technical background.

The Bathurst Sustainable Development Project was founded on the premiss that issues may be resolved if all those concerned work together. In planning, diverse viewpoints are dealt with by the chairman who prevents conflict. Process and mechanisms are in place which exhibit accommodation and information sharing as attention is focused on how the problem may be rectified and which government agencies jurisdiction the problem falls within. Decision are made by consensus at the working group, yet the diverse values, perspectives, and interests are not incorporated into the internal structure of the organization which consists of a marked hierarchy within the provincial Department of Fisheries and Aquaculture.

Strategies

Judging by the indices of integration, the Bathurst Sustainable Development Project exhibits characteristics which give the impression that integrated resource strategies are undertaken. This impression is due to the action-oriented and flexible approach taken in the planning process and the seemingly interactive nature of the organizational culture. In reality, planning in the organization is fragmented within the internal structure of the organization between the working group, technical and public relations committees. From a process perspective, organizational planning is reflexive and occurs as issues are brought to the table.

Issues are directed to the appropriate agency in the form of action items or plans which are monitored at each meeting until the issue is rectified. Even though the organization uses this process as a basis for implementation and controlling, key components to the strategic planning process are wanting. Strategic planning, as an overall process outlining how the organization will achieve its goals and objectives was never undertaken. Evidence was also not exhibited for other recognized aspects of strategic planning. Missing key components include: an environmental analysis, a strategy that formulates how the organization hopes to achieve its goals, a strategy implementation plan and strategic control mechanisms. Within specific parts of the organization, only the public relations component has gone through a strategic planning process and written a plan to follow. This, however, is subject to change following the technical side of the organization. Overall, the lack of a strategic approach and plan formulation curtails the standing of the organization.

The approach which the Bathurst Sustainable Development Project takes to stakeholder participation, similar to planning, comes from the structure and decision-making processes that are in place. Within the internal structure of the organization, the working group is open to whomever wants to participate. The technical and public relations committees are open to local people. Consultation of stakeholders occurs through the field coordinator who contacts members when relevant issues are brought forth. Stakeholders perceive that they only need to attend meetings when issues are pertinent. If individuals come to the organization with an issue and it is resolved they typically leave the process. Interaction with the public and education occurs through the public relations and education component of the project. This should be distinguished from communication and education throughout the entire process, which was not evident.

Ultimately, both planning and interaction strategies are linked to the perspectives employed through the structure, decision-making process and stakeholder participation. The role and responsibilities, structure, and processes and mechanism of the Bathurst Sustainable Development Project all came from the Provincial Department of Fisheries and Aquaculture.

Within this particular agency, an amount of personal perspective is also contributed to the mix. The project manager is in direct command of the project team and serves as chairman of the working group. Consequently, interaction did not occur throughout the analysis and synthesis stages of planning.

The structure of the organization is hierarchical and predicated on decision making with a political and personal perspective which further limits interaction. From the beginning of the organization to present, the perceptions, attitudes, and values of stakeholders reflect the imposed structure, processes, and stakeholder responsibilities. Stakeholders attend meetings if an issue is pertinent or they have been requested to do so by the staff of the Bathurst Sustainable Development Project. Attitudes of stakeholders reflect the political nature of the organizations non-legal standing. Within the organizational culture, leadership, direction and motivation is provided by the chairperson who also works as the project manager through the field coordinator and the public relations officer. As a result, stakeholders may have little input, or incentive for input, into the processes, structure and responsibilities of the organization.

Values

From the outcomes of this research it is clear that the Bathurst Sustainable Development Project has generally placed an emphasis on the regulation and information functions of water. Extending from the roots of the organization has been the use of specific targets. These specific targets emphasize the role and responsibility of the organization to reduce the effluent entering the watersheds. Concomitantly, stakeholders of the Bathurst Sustainable Development Project have recognized the importance of the information function of water. The public relations and education portion of the organization is aimed at administering programs which stress the educational and scientific values which are a prerequisite for future behavioural change.

Broadening the values of water which the Bathurst Sustainable Development Project considers is neither restricted nor facilitated through the planning process. Through specific

targets and programs the organization maintains its interest in the regulation and information (education) values of water. Relatively little attention is given to the production and carrier functions of water. The secondary emphasis put on these values means little acknowledgment, time and field work in these areas.

Conclusion

Based on the profile of desirable characteristics, as shown in Table 5.2, it appears that the Bathurst Sustainable Development Project exhibits characteristics necessary to sustainably manage the water resources of the Nepisiquit watershed, albeit in a limited manner. Judging from the indices of integration, the organization possesses the components necessary for integration to varying degrees. Throughout the managerial elements an emphasis was placed on public sector involvement and legitimization. Sector blending was initiated and maintained through similar political means but not mandated, which further contributes to the constraints of the organization's legal standing. Strategic planning and interaction, hampered by political and personal perspectives, are wanting within the structure, roles and responsibilities, and processes and mechanisms elements. Although the organization explicitly acknowledges the need for consideration of environmental integrity and quality of life, environmental integrity is emphasised. The Bathurst Sustainable Development Project places emphasis on the regulation and information (education and scientific) functions of water through the technical and public relations sections of the organization. Processes that govern the organization eliminate the possibility of foreseeing what direction the organization will take in the future. The absence of some characteristics symptomatic of integration in the components and strategy areas may be a reflection of the New Brunswick Sustainable Development Program. Areas of weaknesses identified in this program have focused on issues of ownership, empowerment and planning and management strategies (Glover, 1996).

Trout Creek Model Watershed

Components

Managing in concert with the components of integration, the Trout Creek Model Watershed Committee has given consideration to the diverse values and inputs of both agencies and private interests. The partnership structure and decision-making processes used in the organization necessitate that consideration occurs in a shared and coordinated manner. Even though the non-legal standing is shared between multiple-participants, the legal standing of the organization is constrained by the absence of By-Laws. The presence of sector blending has not been mandated, given the absence of By-Laws. The presence of sector blending, however, was initiated upon formation and is maintained through the chairperson as deemed necessary. The internal structure and processes used in the organization are orientated toward problem-solving with forethought given to ecological integrity. The attitudes, values and perceptions of organizational members complement these managerial elements and are reflected in the roles and responsibilities undertaken. Legitimization of the organization stems from the accommodation, compromise and information sharing nature of the process.

Strategies

The characteristics exhibited by the Trout Creek Model Watershed reflect the characteristics symptomatic of an integrated approach. Extending from the roots of the organization, stakeholders perceive the organization to be action oriented with a focus on restoring the local environment and increasing public awareness. Although the presence of diverse inputs was not mandated, interaction occurred throughout the analysis and synthesis stages of planning. As a consequence, the internal partnership structure of the organization facilitates strategic planning. As the organization progressed through the different stages of planning particular attention was paid to issues of flexibility and building of capacity. Since the organization does not have a constant source of funding, it has had to maintain flexibility in its attempt to meet objectives. This has been accomplished by shifting projects for which funding was secured while concomitantly building capacity to successfully undertake remedial

measures. The value of capacity building, through the idea of using Trout Creek as a model watershed, prompted the development of external linkages to other agencies and actors who had expertise in stream enhancement. The internal structure and decision making processes of the organization also necessitated interaction and have resulted in shared action space, information dispersal and non-legal standing by multiple participants.

It is the transcendence of personal perspectives that initiated the responsibilities, structure and process of the organization. Albeit a technical perspective is employed, as concentration is on environmental rehabilitation, individuals transcend their personal, political and organizational perspective to concentrate on the problem. The goals and objectives of the Trout Creek Model Watershed Committee are generally indicative of the values, interests and perceptions of all partners. Within this fairly cohesive unit of equal partners, leadership is provided by the chairperson. The chairperson brings motivation, leadership and background experience with the concepts of partnership and pluralism to the organization. The chairperson also works with, and trains, the coordinator. The Trout Creek Model Watershed Committee has endured three different individuals in the coordinator's role.

Values

The results of this research suggest that the Trout Creek Model Watershed Committee, generally recognizes the values associated with water. The role and responsibility of the organization, accentuated by the values and interest of organizational members, have resulted in a primary concern for regulation and carrier functions. A secondary emphasis is on the production and information functions. Prior to the planning, organizing and implementing of activities in these areas, consideration was given to the information function, particularly those of a scientific nature. This provided the foundation and baseline data for subsequent activities. Monitoring and evaluation in both strategic planning and specific plans are undertaken through examining changes in the watershed.

Within the regulation and carrier functions, the processes and mechanisms employed by the organization centered on rehabilitation and maintenance of habitat as means to improved

nature protection and recreational fisheries. Consistent with exhibiting multiple-purposes, the organization has also concentrated on the capability of water to store organic wastes. Interaction has been pursued as a mechanism for behavioural change through communication, education and public awareness. Acknowledgment of the interconnections between all values of water and personal ways in which individuals may help is stressed throughout public awareness.

Conclusion

From the preceding analysis the profile of characteristics symptomatic of integration is shown in Table 5.3. Using the indices for integration, it would appear that the Trout Creek Model Watershed Committee, to varying degrees, exhibits the characteristics required to sustainably manage water in the Kennebecasis watershed. The organization reflects the components and strategies which are key to integration. More concentration, however, could be put on the legal standing of the organization. The use of By-Laws mandating resource sector blending, multiple participant and interaction could be implemented across all managerial elements. Although the organization is flexible and adaptive, opportunity exists to expand the role and responsibility of the organization to include social and economic consequences.

The organization generally does exhibit concern for all values of water and acknowledges their interconnections to environmental quality which is a prerequisite for integration. Logically stemming from the role and responsibilities of the organization is an emphasis on the regulation, carrier, and information (education and scientific) functions. Opportunity exists for the organization to increase the emphasis put on the production and information functions of water.

Eastern Charlotte Waterways

Components

Consistent with characteristics symptomatic of integration, Eastern Charlotte Waterways exhibits breadth in its roles and responsibilities through considering the diverse

Table 5.3. Profile of Characteristics Exhibited By The Trout Creek Model Watershed Committee.

INDICES OF INTEGRATION		MANAGERIAL ELEMENTS				
		Background & Legitimization legal and non-legal standing	Roles & Responsibilities stakeholder participation	Structure institutional arrangements	Processes & Mechanisms ways and means to facilitate decision-making	Organizational Culture stakeholder perception, attitudes and values
COMPONENTS	MPMMMPs multiple-purpose multiple-means multiple-participants	+	+	+	+	+
	Resource Sector Blending balance, breadth and depth	.	.	.	.	.
	Social and Economic Change sensitivity to social, economic and environmental consequences	.	.	.	.	.
	Accommodation and Problem Solving compromise consensus building mediation negotiation information sharing	+	+	+	+	+
STRATEGIES	Strategic action oriented focused early capacity building intuition and judgement based	+	+	+	+	+
	Interactive open participation stakeholder consultation balance and agreement consensus building	+	+	+	+	+
	Multiple Perspectives technical organizational political personal	+	+	+	+	+
VALUES	Regulation Functions water quality, water reservoir/availability, storage and recycling of organic wastes, storage and recycling of human waste, maintenance of biological diversity, nursery and migration habitat	+	+	+	+	+
	Carrier Functions recreation & tourism nature protection aquaculture	+	+	+	+	+
	Production Functions food & nutrients energy drinking water manufacturing	.	.	.	.	.
	Information Functions aesthetic information spiritual/historic information cultural/artistic inspirations educational and scientific information	.	.	.	.	.

+ The characteristic is exhibited strongly.
 . The characteristic is moderately exhibited.
 - The characteristic is weakly exhibited.

values and inputs of stakeholders. The legal standing, structure, and decision-making process, however, precludes the involvement of the public sector. Within the private sphere, sector blending was initiated, shared and mandated through the legal standing. This sector blending appears to be balanced as organizational goals and objectives are shared in a coordinated manner. The internal structure of the organization, where the diverse interests and values come together, is governed by the organizational By-Laws. Mechanisms are in place to facilitate accommodation and compromise among the various stakeholders. A decision-making process is also in place which is based on consensus. It is through the perceptions, values and attitudes of stakeholders that forethought is explicit to both environmental integrity and quality of life in the role and responsibilities of the organization. Within these multiple purposes, initiatives focus on the consequences of environmental degradation, recognizing that social and economic changes are linked to a healthy environment.

Strategies

Congruent with the characteristics of integrated resource management, Eastern Charlotte Waterways stresses interaction and strategic planning. The importance of public participation and information sharing was explicitly acknowledged in the roles and responsibilities of the organization. The external structure of the organization provides an avenue for shared action space and legitimization by the public and private sector. Although participation in the internal structure is limited to non-government people; the diversity of stakeholders values prevailed in the early stages of planning. Personal perspectives were brought to the organization and resulted in conflict, despite the presence of an accommodation component.

Changes within the organization culture resulted in a shift in leadership. In conjunction with this shift, came negotiation among stakeholders which transcended personal perspectives. Subsequently, stakeholder's roles and responsibilities were resumed and the process of planning commenced.

Due to the diversity of values, attitudes and perceptions, the initial time exhibited for planning is expected when managing in accordance with integrated strategies. The process of planning was initially focused on the future of the L'Etang estuary. This initial focus was expanded to conducting an environmental quality assessment of the watersheds of Eastern Charlotte. Although the organization is early on in the strategic planning process, presently forming their comprehensive environmental management plan, it has undertaken many initiatives which have exhibited characteristics of being pro-active, action oriented and flexible. Through these initiatives, external linkages have been capacity building and legitimization has been established by sharing action space with both private actors and government agencies.

Strategic planning and implementation of projects occurs through the internal structure and decision making process of the organization. The internal structure of the organization facilitates strategic planning by mandating sector blending and interactive elements. Constant communication and education between all stakeholders occurs through the executive director and program administrator. Within the decision-making process, a larger vision is maintained and action is stressed through the undertaking of pro-active initiatives. In undertaking these various initiatives the organization exhibits characteristics of flexibility and adaptability.

Within the internal structure, it is the executive director who provides motivation, leadership and managerial expertise. Although all members of the organization may contribute such attributes, it is the perception and attitude of stakeholder's that the executive director and project administrator are responsible for the general workings of the organization and ensuring capabilities match implementation efforts.

Values

The results of this research indicates that, to varying degrees, Eastern Charlotte Waterways considers the full range of water values. Since ECW is in the formative stages of strategic planning, concentration is on the information (education and scientific) function of water. As the foundation to the planning process, Eastern Charlotte Waterways has just completed and published an environmental quality assessment for the watersheds of Eastern

Charlotte. Attention during this time focused on the scientific information function of water to gather data. Within this environmental quality assessment, specific attention was given to water quality, recycling of organic and human waste, recreation and tourism, aquaculture, and food and nutrients.

The attitudes and values of stakeholders within Eastern Charlotte Waterways have shaped the responsibilities undertaken through the internal structure. Initiatives undertaken thus far have put an emphasis on the regulation, carrier and production functions of water. In particular, the educational function value has been fundamental to building credibility with the community. Linkages to other agencies and actors involved with water management have been formed through the external structure of the organization. By developing an environmental quality assessment and undertaking initiatives, Eastern Charlotte Waterways has established non-legal standing for all of the values of water.

Conclusion

Stemming from the preceding analysis, a profile of exhibited characteristics was generated for Eastern Charlotte Waterways in Table 5.4. Based on the review of characteristics symptomatic to integration, Eastern Charlotte Waterways would appear to generally exhibit the elements necessary to sustainably manage the water resources of Eastern Charlotte as the organization exhibits components and strategies which are indicative of integration. Mandating interaction and public participation brought diverse values and attitudes together. Although it took time to achieve balance and agreement among stakeholders, such processes are expected and form a solid foundation for the remainder of the planning process. Although the organization is non-governmental in their internal structure, external linkages and support from government agencies are maintained. It is also through forethought in relation to the environment that the organization seeks to address social and economic consequences.

The organization does acknowledge each of the functional values of water. Initiatives undertaken thus far reflect the attitudes and values held by stakeholders in the organization

and focus on particular parts of each broad functional category. Through the development of the environmental quality assessment, recommendations were made in each functional area. Opportunity exists in the subsequent planning process to expand consideration within each function category and take actions accordingly.

The St. John River Society

Components

The St. John River Society, in accordance with the indices of integration, considers multiple-purposes and multiple-means to achieve them. The roles and responsibilities, as reflected in the By-Laws of the organization, lend support to the fact that the organization possesses decision-making processes which are sensitive to both environmental and social consequences. The purposes, process of planning and implementing initiatives reflect the stakeholder's attitudes and values towards fostering appreciation for the river. Forethought is specifically given for social (historical) issues. These values are perpetuated through the recruiting process. Membership is open to any individual or organization that supports the multiple purposes of the organization. A process is not in place which involves gaining input from government agencies or from various resource sectors. Correspondingly, the legal standing of the organization does not stipulate resource sector blending. Given that the role and responsibilities of the organization stem from the legal standing of the organization, formulated by the founding members, input to the organization has not been diverse. Mechanisms outlined in the legal standing of the organization, however, are in place to deal with diversity and conflict amongst stakeholders. These mechanisms do not stress accommodation, compromise or negotiation; rather, they reflect a democratic decision making process. Information sharing is highlighted as a responsibility of the organization.

Strategies

To undertake its multiple-purposes, the St. John River Society implements strategies which exhibit characteristics not symptomatic of integration. The roles and responsibilities of the organization, as outlined in the legal standing, are focused on social consequences, but

do provide flexibility to be adaptive. Within the internal structure of the organization, a formal process of planning is not in place. Planning occurs through the executive committee which is guided by the multiple-means to achieve the purposes of the organization as outlined in the By-Laws. The components necessary for conventional planning are not present or followed. Generally, the organization exhibits characteristics of being cognizant of implementation capabilities.

Intuition and judgement have formed the basis for the St. John River Society. Early legitimization came from the founding members who believed the river required a voice. Concern surrounding the legitimacy of the organization did not go beyond their own judgement. Mandating interaction to increase the diversity of values present during planning was never undertaken. Public participation is encouraged through the purchasing of memberships, however, this has not necessarily translated into responsibilities within the organization.

Within the internal structure of the organization, the individuals which make up the board and especially the executive committee provide leadership and carry out most of the workings of the organization. Although new people have been brought into the organization, much leadership and responsibility resides with those individuals that founded the organization. Within this core group, characteristics of multiple perspectives are present but not transcended. The personal perspectives which continue to unite the core group are combined with the political perspective brought by some of the members to show concern regarding the river.

Values

Generally, the characteristics exhibited by the St. John River Society suggest that the organization does not acknowledge the full values of water. Although responsibilities outlined in the legal standing of the organization explicitly acknowledge environmental and social consequences; the majority of initiatives undertaken through the organization's processes and mechanisms have focused on the information function of water. Attention to this

component is a reflection of the values of stakeholders. Initiatives undertaken within the information function have been exhaustive and have included: aesthetic, spiritual and historic, cultural and artistic, and educational.

Within the broadly defined role and responsibility for the organization, attention is broadening to undertake initiatives in the regulation and carrier functions. Initiatives undertaken regarding issues of wake reduction and holding tanks suggest such change is occurring. Although consideration to these values remains in it's infancy, the St. John River Society is beginning to emphasize the functions related to the role of environmental stewardship.

Conclusion

Based on judgements made using the indices of integration, the St. John River Society appears to exhibit the principles of integration in a limited manner (Table 5.5). At the heart of the St. John River Society is the organizational culture which is driven by a core group of founding individuals. Their personal and political perspectives are cemented in the roots of the organization. It was the intuition and judgement of this core group that defined the roles and responsibilities of the volunteer organization and focused primarily on social consequences. Since much of the legitimization, internal structure and roles and responsibilities have come from these individuals, the same core group undertook most managerial duties.

Since the organization was formed in the preceding manner, consideration to the principles of integration appear limited. Legitimization is challenged by the lack of strategic planning, planning documents and interaction. Failure to initiate, maintain and mandate sector blending and involvement of government agencies is manifested in the organization's non-legal standing. Public participation and support is given through the purchasing of memberships, however, direct involvement in the internal structure and roles and responsibilities resides in the core group. Although diverse values and attitudes do not appear because of a general lack of interaction, mechanisms are in place to handle conflict. These also reflect the political perspective as they are not built to accommodation and problem

solving, rather immediate resolution. The organizational culture reflects the interests and perspectives of the core group. Subsequently, consideration for social consequences and the information function of water is stressed.

Even though the organization exhibits few of the characteristics symptomatic of integration, opportunity exists for the organization to build upon their relatively broad legal standing. Involving the public in the roles and responsibilities as well as mandating interaction, sector blending, and involvement of government agencies all would enhance most managerial elements. The By-Laws also allow for the hiring of a coordinator which may change the organizational culture, internal structure, and permit the organization to broaden its scope. Since the organization is recognized through its non-legal standing, in particular for the information function of water, expanding its breadth and depth has potential. Evidence of this expansion is occurring as the organization plans to undertake initiatives which bridge the regulation and carrier functions of water.

Cross-Case Analysis

The purpose of cross-case analysis was to determine if characteristics symptomatic of integration were similarly exhibited by all five cases. The profile of symptomatic characteristics, generated for each case, formed the basis for the cross-case analysis. Each case profile was compiled into a synthesis profile following the theoretical framework as shown in Table 5.6. The synthesis profile was inspected for similarities and differences in characteristics exhibited by the cases. These were detailed in the principle areas of resource components, values and strategies. Consistent with the rationale presented in Chapter Three, if all five cases exhibited characteristics symptomatic of integration at the same intensity it would indicate considerable cross-case consistency. For example, if all five organizations exhibited characteristics that matched the reliable symptoms of the “interactive” indicator with a strong (+) intensity, it would suggest that the community-based water management organizations in New Brunswick collectively exhibit the characteristic of interaction at a

Table 5.6. Profile of Characteristics Exhibited Collectively by the Organizations Studied

INDICES OF INTEGRATION		MANAGERIAL ELEMENTS																								
		Background & Legitimization legal and non-legal standing					Roles & Responsibilities stakeholder participation					Structure institutional arrangements					Processes & Mechanisms ways and means to facilitate decision-making					Organizational Culture stakeholder perception, attitudes and values				
		CASES STUDIED																								
M R E A C	B S D P W	T C M W	E C W	S J R S	M R E A C	B S D P W	T C M W	E C W	S J R S	M R E A C	B S D P W	T C M W	E C W	S J R S	M R E A C	B S D P W	T C M W	E C W	S J R S							
COMPONENTS	MPMMPS	+	•	+	•	•	+	•	+	•	•	+	•	+	+	•	+	•	+	•	•	+	•	+	•	•
	Resource Sector Blending	•	-	•	+	-	•	-	•	+	-	•	-	•	+	-	•	•	•	+	-	•	•	•	+	-
	Social and Economic Change	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Accommodation and Problem Solving	+	•	+	+	•	+	•	+	+	•	+	•	+	+	•	+	+	+	+	•	+	•	+	+	•
STRATEGIES	Strategic	+	-	+	+	-	+	-	+	+	-	+	-	+	+	-	+	-	+	+	-	+	-	+	+	-
	Interactive	+	•	+	+	•	+	•	+	+	•	+	•	+	+	•	+	-	+	+	-	+	•	+	+	•
	Multiple Perspectives	•	-	+	•	-	•	-	+	+	-	•	-	+	+	-	•	-	+	+	-	•	-	+	+	-
VALUES	Regulation Functions	+	+	+	+	-	+	+	+	+	-	+	+	+	+	-	+	+	+	+	-	+	+	+	+	-
	Carrier Functions	•	-	+	•	•	•	-	+	•	•	•	-	+	•	•	•	-	+	•	•	•	-	+	•	•
	Production Functions	•	•	•	•	-	•	•	•	•	-	•	•	•	•	-	•	•	•	•	-	•	•	•	•	-
	Information Functions	•	•	•	•	+	•	•	•	•	+	•	•	•	•	+	•	•	•	•	+	•	•	•	•	+

Legend

- +The characteristic is exhibited strongly.
- The characteristic is moderately exhibited.
- The characteristic is not exhibited.

MREAC = Miramichi River Environmental Assessment Committee
 BSDP = Bathurst Sustainable Development Project
 TCMW = Trout Creek Model Watershed
 ECW = Eastern Charlotte Waterways
 SJRS = St. John River Society

strong intensity within the principle area of strategies. The collective exhibition of characteristics symptomatic of integration by all organizations studied is summarized in the conclusion. Areas in which cross-case consistency was attained are highlighted. The cross-case analysis constitutes the knowledge necessary to address the three questions posed at the onset of this research and ultimately reach conclusions regarding the potential contribution to sustainable water management by community-based groups in New Brunswick.

Components

The organizations exhibit consideration of diverse values and inputs of both agencies and private interests in a shared and coordinated manner to varying degrees. The roles and responsibilities of all organizations reflect both multiple-purposes and multiple-means. Three of the organizations gain input from multiple-participants through their internal structures, one through their external affiliations, and one does not employ multiple-participant input. Gaining input into the planning and decision-making process from sectors was initiated and maintained by four of the organizations. Although initiating and maintaining sector blending has ramifications for all managerial elements, legitimization for sector blending was especially reduced as only one organization mandates it through their legal standing.

The ability to deal with the diversity of attitudes and values brought together in the internal structure was, to varying degrees, exhibited by all. Processes and mechanisms which govern the decision-making processes were of two main types. The four organizations that had diversity of values and attitudes among stakeholders used processes and mechanisms that were orientated towards accommodation and problem solving. The foundation of the decision-making process was information sharing with decisions being made among stakeholders through a consensus building nature that stressed compromise. The fifth organization implements decision-making processes that are democratic and which do not necessarily stress accommodation. Although four of the organizations stress accommodation and compromise in the decision-making process, evidence of accommodation in the planning process was not as prevalent. Of the five organizations, three have undertaken a strategic

planning process. Within these, one organization does not exhibit legal standing and as a result mechanisms that facilitate accommodation in planning are not written or formalized.

Stemming from the planning processes and reflecting the attitudes and values of organizational stakeholders, are the goals and objectives of the organizations. No organization exhibits roles and responsibilities that equally show forethought to environmental integrity and quality of life. Non-legal standing is given by agencies and actors in four organizations for primarily considering environmental consequences. These organization express sensitivity to quality of life, however, it is their perception that social and economic consequences are tied to a healthy environment. The other organization, as a reflection of their organizational culture, has placed primary emphasis on social consequences through stressing the information functions of water -- environmental consequences are a second area of concentration.

Strategies

The organizations, to varying degrees, exhibited characteristics of an interactive approach to resource management. Collectively, the community-based organizations would appear to moderately exhibit some of the characteristics of being strategic in nature. Initiatives stemming from the roles and responsibilities, facilitated through the internal structures of the organizations, exhibit characteristics that the planning process is action oriented and focused early. Although these are reliable symptoms of strategic planning, evidence also indicates that some characteristics of strategic planning are wanting. Within the five organizations, only three exhibit characteristics indicating consideration of the components of the strategic planning process and undertaking it in an interactive manner.

All organizations exhibit, to varying degrees, characteristics symptomatic of an interactive approach. Open participation is encouraged in the organizations through communication and education. The internal structure of the organizations facilitated these interactions. Stakeholder consultation occurs via the interface of the organizations and involves linkages with other groups. Within the decision-making process, four of the organizations exhibit characteristics of consensus building among stakeholders. Although reliable symptoms

of interaction are exhibited by all organizations, interaction has not been ongoing -- particularly throughout the synthesis and analysis stages of planning. Specifically, the three organizations which followed the components of strategic planning have enhanced legitimization from identifying the diverse values and inputs of stakeholders. Consideration of the diverse inputs and values did add time to the initial stages of planning to one of the organizations. Although more time was required, characteristics exhibited in both legal and non-legal standing were subsequently enhanced.

The planning process, to the extent it was exhibited, forms the basis for all other managerial aspects. The perspective(s) that the community-based organizations employ through the internal structure and processes to undertake their responsibilities are a reflection of stakeholders attitudes and values. Generally, these attitudes and values stress the purposes of the organization. The reliable characteristics of transcending individual perspectives to an "intersperspectary" approach was exhibited in three organizations. The presence of political and personal perspectives prevent two of the organizations from undertaking an "intersperspectary" approach. Stakeholder's perceptions, to an extent, also define how the internal structure and processes operate to fulfil the organizations responsibilities. Although the organizational culture is distinct for each community-based group -- motivation, leadership and general management are perceived to be the role of one individual. Within the internal structure, this individual occupies the position of executive director or chairperson in all the organizations.

Values

The five organizations, to varying degrees, consider the full range of values associated with water. The attitudes and values of stakeholders, reflected in the responsibilities of organizations, have resulted in the undertaking of initiatives through the internal structures of the organizations. Consistent with placing a priority on environmental consequences, four of the organizations strongly consider the regulation function of water. In particular, the issues of water quality and the storage and recycling of both human and organic wastes.

The information function receives moderate consideration by all organizations and reflects the general secondary consideration given to social consequences. In organizations that have undertaken a strategic planning process, the generation of scientific information plays an important role in the environmental assessment and subsequent legitimization. Concomitantly, all organizations have initiated and maintained an educational and public awareness component. Only one organization, however, considers the other values within the information function.

The responsibilities and planning of the organizations studied reflect less consideration given to the carrier and regulation functions of water. In particular, the recreation and tourism functions within the roles and responsibilities were not well recognized. The poor recognition may stem from the presence of organizations with a specific interest in recreational fisheries, however, representation of both recreation and tourism sectors were weak in the internal and external structures of four organizations.

Conclusions

In sum, characteristics symptomatic of integration were collectively exhibited differently in each principle area. In the principle area of resource components, cross case consistency was established for social and economic change under all managerial elements at a moderate intensity. The responsibilities undertaken by each, as a reflection of the organizational cultures, has emphasized environmental consequences in the decision-making and planning process -- social and economic consequences are a second priority. Cross-case consistency was unattainable in the principle area of resource strategies as the organizations exhibited characteristics at varying intensity. Finally, in the principle area of resource values, cross-case consistency was established in the regulation, production and information functions of water. Characteristics symptomatic of the regulation functions were collectively exhibited strongly by the organizations. The production and information functions were exhibited with moderate intensity.

CHAPTER SIX

CONCLUSIONS AND REFLECTIONS

Analysis is expanded further in this chapter by addressing the specific central questions posed at the onset of the study. Discussion focuses on the experiences of the organizations studied in relation to the literature regarding sustainable water management. These questions are directed towards determining if the initiatives studied possess the elements necessary to sustainably manage the water resources of New Brunswick. The discussion provides the foundation for second level analytical generalization, or as Manning suggested “a critical step [towards sustainable development] will be to identify success stories; what works in practice, why does it work, and what can we learn from good examples which can be replicated elsewhere” (1992, p. 8). Ultimately, conclusions are drawn regarding the contribution of community-based organizations to sustainable water management in New Brunswick and recommendations are offered towards furthering progress in sustainable water management. Final reflections come from insights gleaned through the research experience and consider the method followed and the potential avenues for future research.

Discussion

Research Question One - Do community-based organizations in New Brunswick manage water resources in accordance with established integrated resource management components?

All the organizations studied exhibited characteristics symptomatic of integrated resource management components with some intensity. It was evident from the cross-case analysis that the intensity to which the characteristics were exhibited varied for: multiple-purpose, multiple-means and multiple-participant strategies; resource sector blending; and accommodation and problem solving. For the social and economic change indicator, cross-

case consistency was established at a moderate intensity. Although cross-case consistency was only established for one indicator in the resource components area, the experience of community-based initiatives coincides with observations made elsewhere. For example, the findings of this research concur with observations made by Mitchell and Shrubsole (1997). They made the point that when synthesizing the experience of moving from ideas to action “at an operational level, the success of integrated water planning initiatives depends not only on the substantive issues, but also on procedural and people issues” (Mitchell and Shrubsole, 1997, p. 320). Similarly, the human factor was identified as a precondition for co-management and recognized as a major barrier to integrated catchment management in Western Australia (Pinkerton, 1989; Mitchell, 1997). In the same vein Savory (1988), Mitchell (1989) and Vining (1990) all caution that unless a diversity of values and inputs are initiated, maintained and mandated to subsequently form the basis for the planning process; the possibility of arriving at goals and objectives in a shared, coordinated and committed manner is questionable. (Savory, 1988; Mitchell, 1989; Vining, 1990). Initiating, maintaining and mandating diversity was shown to increase the amount time, money and negotiation required during the planning process. Subsequent to the planning process, however, such diversity was shown to aid efficiency by eliminating future standoffs. The experience with incorporating diversity of values and inputs in planning process was consistent with Lang (1986), Savory (1988) and Mitchell (1989).

Most organizations exhibited characteristics of accommodation and compromise in their processes and mechanisms. Exhibiting these characteristics are important to the decision-making process and have ramification for partnerships (Mitchell, 1986; Mitchell and Shrubsole, 1997). Despite the presence of accommodation and compromise, organizations that failed to incorporate diversity in planning exhibited reduced non-legal standing. The organizations studied thus confirmed the importance of diversity in planning to legitimization as predicted by Mitchell (1986) and Mitchell and Shrubsole (1997).

As a reflection of the organizational culture, the purposes of the organizations generally show a desire to enhance quality of life through placing emphasis on ecological integrity. Resource management is viewed by all organizations as a means rather than an end (Mitchell, 1986). In particular, all organizations emphasize the role of knowledge, understanding and education. Mitchell and Shrubsole suggest these “are the pillars around which sound environmental policies are built” (1994, p. 53). In general, the organizations studied also exemplify the idea of stewardship through knowledge and commitment which has been identified as a major theme to sustainable water management (Hilts, 1990; Mitchell and Shrubsole, 1994, 1997). Economic considerations and user pay, which have been called for by many authors such as Tate (1991) and Bruce and Mitchell (1995) were not exhibited by the organizations studied. This, however, is consistent with the New Brunswick experience.

The community-based organizations studied in this research, to varying degrees, manage water resources in accordance with established integrated resource management components. The varying intensities to which characteristics were exhibited confirmed the assumption that low levels associated with any or all of the indices suggest operational barriers to water management sustainability.

Research Question Two - Do the community-based organizations concerned with water management in New Brunswick consider the full range of resource values?

All the organizations studied exhibited characteristics symptomatic of recognizing the full range of resource values with some intensity. In the cross-case analysis it was established with consistency that the regulation function was strongly exhibited and the production and information functions were exhibited with moderate intensity. Organizations recognized the carrier function with varying intensities.

As the integrated resource management and interdisciplinary literature indicates, failure to recognize and consider all resource values may indicate a lack of commitment to or understanding of integration and sustainability (deGroot, 1992; Mitchell and Shrubsole, 1994). Through utilizing deGroot’s (1992) functional categories an attempt was made to

eliminate the economic value subjugation and embrace an ecosystem approach required for sustainability.

All the organizations studied, as outlined in the criteria for case selection, use the watershed as a boundary or spatial management unit for their organization. This is consistent with many in the field who suggested that use of the watershed boundary is the most appropriate spatial unit for water management and one aspect of an ecosystem approach (Kreutzwiser, 1991; Mitchell and Shrubsole, 1992; Mitchell and Shrubsole, 1994; Mitchell and Shrubsole, 1997).

Mitchell (1991) has indicated that integration may occur at three levels which constitute the breadth of an ecosystem approach. The first level of integration, to which Mitchell and Shrubsole (1997) suggest Canada could make more progress, is between water management functions. The organizations in this study, generally, exhibited a high level of integration at this level. Within the responsibilities undertaken by the organizations, primary emphasis was on the regulation function. In particular, initiatives undertaken by the organizations generally concentrate on water quality and the storage and recycling of wastes. The second level suggested involves interaction between the hydraulic cycle and human uses. Generally, the organizations studied gave less consideration to this level. Emphasis was placed on environmental consequences with a priority being given to education and public awareness. Scientific information was emphasized in organizations which have undertaken strategic planning during the environmental assessment stage. Characteristics symptomatic of other values within the information function category, such as aesthetic, along with the carrier and production functions were exhibited with less intensity. Generally, recreation and tourism were not considered in the roles and responsibilities or incorporated into the internal and external structure of the organizations. The attitude and values of stakeholders reflect a priority on water quality and public awareness rather than users such as recreation and tourism. The third level suggested involves a union of water with other resources, as well as with economic and social development elements. In two of the organizations studied, diversity in

planning is evident between water and other resources, however, as suggested through the social and economic change indicator of integration, attention by these organizations remains focused on environmental consequences. The depth of an ecosystem approach has been an ongoing debate, however, the attention to natural values by these organizations reinforces the assertion by Mitchell and Shrubsole that “there is no doubt that a major shift which incorporates natural values more explicitly has occurred” (1997, p. 310).

The community-based organizations studied in this research, to varying degrees, recognize the full range of resource values. The varying intensities to which characteristics were exhibited confirmed the assumption that failure to recognize the full range of resource values suggests a lack of commitment or understanding to integration and sustainability.

Research Question Three - Do community-based organizations in New Brunswick implement integrated resource management strategies or approaches in their organization and operation?

All the organizations studied exhibited characteristics symptomatic of integrated resource management strategies with some intensity. The cross-case analysis established that symptomatic characteristics were not consistently exhibited by the organizations for any of the indicators. Although characteristics symptomatic of resource strategies were exhibited with varying intensities by all organizations, the experiences with strategic planning, interaction and multiple perspectives are in concert with observations generally made regarding operationalizing integration and sustainable management.

Within the organizations, stakeholders were sought out through multiple participation strategies. The manner in which partnerships have been formed by the community-based organizations in New Brunswick are diverse and reflect the myriad of types for achieving sustainability as noted by Mitchell and Shrubsole (1997). Although the organizations generally have decision-making and planning processes in place that are consensus based and reflect accommodation and compromise, little power sharing is evident from government agencies. There has not been a movement in New Brunswick to devolve power and build capacity in

these community-based groups. The sphere of influence exerted by these groups come from recognition. Consequently, the nature of the partnerships, equality of stakeholders, and the issue of empowerment which has been called for under the sustainable development ethic is missing (Carley and Christie, 1993; Kernaghan, 1994).

Generally, the outcome of this research was consistent with Mitchell and Shrubsole's assertion that "there does not appear to be any single approach to pursue integrated planning. However, its credibility is enhanced when management problems are well documented and recognized" (p. 320). Barriers to integration in the institutional arrangements of the community-based organizations studied stemmed from poor legal standing as a consequences of not undertaking strategic planning and stressing interaction. All organizations, through their internal structures exhibited characteristics symptomatic of being strategic such as an action orientation, focusing early and being flexible and adaptive. The most evident barrier to integration occurred when organizations did not follow the fundamental components of a strategic planning process -- environmental analysis, establishing organizational direction, strategy formulation, strategy implementation and strategic control (Certo, Appelbaum and Shapiro, 1993).

Linked to the process of strategic planning, organizations should exhibit the capacity to handle diverse values and inputs in the planning process. Judgements made from the indices of integration demonstrate that the organizations exhibited, to varying degrees, the use of multiple-participant strategies, resource sector blending, interaction, and accommodation and compromise across managerial elements. Organizations which did initiate and maintain diversity in the planning process showed increased time, money and negotiation. These organizations subsequently demonstrated increased efficiency through the elimination of future standoffs which was consistent with Lang (1986), Savory (1988) and Mitchell (1989). The absence of interaction in the planning process of some organizations suggests operational barriers to integration. Legitimization was affected two-fold. Legal standing was reduced when organizations failed to produce planning documents or failed to undertake

a strategic planning process. The results of this research confirmed the assertion in the literature that credibility may be affected by such shortcomings (Mitchell and Shrubsole, 1997). Shared recognition and joint action space were also found to be reduced in organizations which did not undertake interactive strategic planning. From examples elsewhere, Mitchell (1997) cautions that failure to legitimize the process may thwart successful implementation of an integrated resource approach.

The key strategies for integration, to varying degrees, are present in the operational arrangements of the water management organizations. The varying intensities to which characteristics were exhibited confirmed the assumption that the absence of these indices suggest operational weaknesses in the implementation of integration and sustainable management.

Conclusions

The purpose of this research, as outlined in the first chapter, was to determine if the community-based water management organizations in the province of New Brunswick possess the elements necessary to sustainably manage the water resources of the province. Since cross-case consistency was only attained in a few elements an unequivocal answer is not possible to the question posed. From the cross-case analysis, it may be concluded that the organizations studied possess the elements necessary for sustainable water management to varying degrees. The conclusion generally confirms the observation by Mitchell and Shrubsole that “there does not appear to be any single approach to pursue integrated planning” (1997, p. 320).

Equally important to the conclusion are the analytical generalizations which may be made to the theories upon which this research was based. Discussing the experiences of the organizations studied in light of the literature generally confirmed observations and theories regarding the operationalization of sustainable management.

The findings of this research reinforced the fundamental and interrelated nature of the indices of integration to the achievement of integrated resource management as originally put forth by Mitchell (1986) and Lang (1986). They also confirm the interrelations between indices and the primacy of planning to management. Mandating strategic planning which was interactive increased the amount of time and negotiation required early in the process. It also provided a diversity of values into the process, enhanced subsequent legitimization and strengthened stakeholders commitment as identified by Lang (1986). The organizations studied reflected the assertion made by Mitchell and Shrubsole (1997) that the procedures and people involved appear to be just as important as environmental issues. The human factor, present in the leadership and culture of the organizations, was confirmed to either facilitate or represent a barrier to implementation of integration. This was also found by Pinkerton (1989) and Mitchell (1997) in their studies of attaining fisheries and total catchment management.

The findings of this research further reinforce the need for managers to account for or value all functions of water. In terms of deGroot's (1992) four function categories, the organizations studied consider all categories, but emphasize the regulation function. By recognizing the broad range of values, these organizations also exhibit integration at the three levels which reflect the breadth of an ecosystem approach as described by Mitchell (1991). The organizations all utilized the watershed or drainage basin as a boundary or spatial management unit which is one aspect of an ecosystem approach (Mitchell and Shrubsole, 1997). Hence, these community-based approaches represented an important component of a water management system.

In addition to confirming the general theories of integrated resource management and functions of the natural environment, the community-based organizations studied lend support to the philosophy of sustainable development and represent an integral component to a national sustainable water management system. Experiences gleaned from this research contribute to the understanding of the operationalization of sustainable development,

community development and the changing role for organizations and institutions involved with water management.

The discussion surrounding the sustainable development ethic has placed much emphasis on the importance of a bottom-up approach (Carley and Christie, 1993; Sellers, 1995; Naresh and Titi, 1995). The efforts of the water management organizations studied confirm and reinforce the importance of stewardship and community involvement as called for in Agenda 21 (Hilts, 1990; Mitchell and Shrubsole, 1997) and the characteristics exhibited by the organizations studied confirm the preconditions as outlined by Pinkerton (1989) and Mitchell (1997) for co-management. Further, it appears that these efforts also fill a void. Mitchell and Shrubsole, suggest that “people must be involved in the development and implementation of sustainable water management concepts. Their cooperation cannot be mandated from Ottawa, provincial or territorial capitals, or First Nations band offices” (1997, p. 321).

Community development is an important foundation for society. Wileden offers that “... if a community is literate, the nation is literate; if the community is economically sound, the nation is economically sound; if the community is physically, morally and spiritually healthy, the nation is physically, morally and spiritually healthy” (1970, p. 1970). The organizations studied facilitate stakeholder participation through their internal and external structures. The values and attitudes of stakeholders, tempered by accommodation mechanisms, indicate a common vision. The undertaking of initiatives exhibit cooperative work and suggest development of capacity to take action. Positively influencing quality of life through the provision of information and the promotion of understanding are important characteristics of community development (Christenson and Robinson, 1980; Dykeman, 1986; Stacey, 1995). The organizations studied, in their roles and responsibilities, exhibited consideration for environmental integrity and quality of life. Within these, the organizations specifically promote public awareness and education to ultimately promote understanding.

Although the organizations studied embodied the philosophical underpinnings of the sustainable development ethic and the idea of community development, the nature of the partnerships and the influence exerted by these initiatives is not consistent with the theme of empowerment in the literature (WCED, 1987; Sadler and Jacob, 1990; Mitchell and Shrubsole, 1994; Kernaghan, 1994). In summarizing national and international experiences, Mitchell and Shrubsole have suggested that “while subsidiarity is advocated by Agenda 21, the move to decentralize is often motivated by senior governments’ desire to reduce their financial obligations” (1997, p. 318). The devolution of power by governments in a capacity building effort has not occurred in the context of the organizations studied.

In sum, the community-based organizations studied in this research possess the elements of a bottom-up perspective and the spatial boundaries that represent an ecosystem approach. Even though the breadth of the ecosystem approach varied, these initiatives represent a unique opportunity at the provincial, regional, and national scale. The community-based organizations studied represent an opportunity for co-management which is an integral part of the nested basin ecosystem approach that has emerged as a recognized system for environmental management (Bruce and Mitchell, 1995; Mitchell, 1997; Mitchell and Shrubsole, 1997). The analytical generalizations derived from the study: contribute to the theoretical understanding of operationalizing integrated resource management, buttress the appropriateness of the Canadian Water Resources Association’s sustainability principles, and confirm the pertinence of a sustainability ethic.

Recommendations to Further Sustainable Water Management

From the conclusions reached through this research and their potential implications recommendations are offered to further sustainable water management. Recommendations are made to community-based organizations concerned with sustainable water management and the agencies and actors involved with the management of Canada’s water resources.

Recommendation One

All community groups should consider diversity of values and inputs across all managerial elements. Initiating, maintaining and mandating such diversity is essential to all aspects of the organization and in particular the planning process. Failure to undertake interactive planning has ramifications in the culture and legitimization of the organization.

Recommendation Two

All community-based organizations should undertake a strategic planning process which is interactive in nature. The process of planning, in the results of this research and in the literature, was fundamental to all other managerial functions. Legitimization and organizational culture, in particular, are linked to interactive strategic planning and the publishing of related documents.

Recommendation Three

All community-based organizations studied should recognize the full range of values associated with water. In particular, the carrier and production functions would appear to require additional attention.

Recommendation Four

Partnerships with community-based organizations should be subsidiarity in nature. In other words, decision-making should be decentralized to the most appropriate level “to ensure that sustainability is achieved through democratic and equitable means” (Mitchell and Shrubsole, 1997, p. 317). Empowerment may take a myriad of forms, such as legislative, enforcement and jurisdictional authority. Financial and in-kind support along with the devolution of power should be based on criterion measures rather than a politically driven process.

Recommendation Five

A type of registry should be developed for community-based groups concerned with water management. This could be accomplished through information technologies. Such a

mechanism would be useful to community-based groups, government agencies and industry to identify similar groups and form linkages.

Recommendation Six

The Province of New Brunswick should follow Nova Scotia's lead and develop a water resource management strategy. Such a strategy should contain objectives for the province's water resources and the means by which they will be realized. Following the ethic of sustainability, stakeholder involvement at the community level should constitute a substantial portion of the strategy. For example, local water advisory boards are one of four main themes in the strategy being developed by the Nova Scotia Department of the Environment. Implementation plans are also outlined to support and assist these community-based groups.

Recommendation Seven

Planning and management efforts at the national, provincial and regional levels should be coordinated to move towards the emerging nested basin ecosystem approach. Every effort should be made to build the capacity of community-based water management organizations as they represent a key scale for this approach.

Methodology and Future Research Considerations

This final section considers methodological refinements and identifies avenues for future research. Specifically, the multiple-case method and theoretical template that constituted the research design are critically reflected. The procedures followed in this study should continue to be used as a method to investigate organizations in the realm of resource management. The multiple-case study method proved to be a suitable methodology. Not only did it provide a means by which an in-depth understanding of the organizations could be reached, but it provided a means to relate the theoretical template to practical examples. The use of triangulation to gain convergence of organizational details proved to be effective and efficient. The multiple sources of evidence contributed to the robustness of the methodology.

The theoretical template used throughout the research was generally beneficial as it linked the questions and propositions to data collection and analysis. The template also provided guidelines throughout the project to ensure consistency and focus. Although utilizing the template was beneficial, two aspects require further consideration. First, information which overlaps elements and/or indices should be minimized. A majority of data gathered throughout the study were not mutually exclusive. Consideration should be taken to reduce repetition while maintaining comprehensiveness. Second, future research should continue to promote understanding and refine criteria to the extent possible. Given the interrelated and nebulous nature of the criteria a certain amount of discernable subjectivity was required in their employment.

Undertaking research in the realm of sustainable water management through the multiple-case study method elucidated two potential avenues for future research. First, the community-based organizations studied should remain the topic of further research. Continued examination of institutional arrangements at the community level could determine if the findings of this research are unique to spatial, national, or cultural constraints. Since the organizations are in their infancy, longitudinal research would contribute to understanding the developmental process in community-based groups and the evolution of the sustainability ethic. Second, the potential for sustainable water management should be described and analysed at the provincial and federal level. Investigating other levels is important as 1) organizational capacity at the federal level is wanting (Bruce and Mitchell, 1996); 2) community-based initiatives depend on linkages to these agencies; and 3) understanding the reliance that agencies have upon the community-based organizations may reveal the importance of these initiatives to the overall system of water management.

REFERENCES CITED

Armour, A. (1986). Issue management in resource planning. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.51-67). Calgary: University of Calgary Press.

Atlantic Development Board. (1969). Water resources of the Atlantic provinces. (Background Study No 6). Ottawa: Queen's Printer for Canada.

Austin, J. (1972). Canadian water policy: History, problems and recent developments. In Organization for Economic Co-operation and Development. Water management: Basic issues (pp. 77-84). Paris, France: Author.

Bajard, Y. (1990). The case for conceptual change to meet the challenge of sustainability. Innovations in river basin management: Proceeding of the 43rd annual conference of the Canadian Water Resources Association. (pp. 63-79).

Baldwin, B., & Milewski, I. (1997, October 20). MREAC not much of a watchdog [Letter to the editor]. The Telegraph Journal.

Bangay, G. E. (1986). Integrated data base management: the great lakes experience. Integrated data base management: the great lakes experience. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.149-169). Calgary: University of Calgary Press.

Bathurst Sustainable Development Project. (1996). Living and working in a healthy Bathurst environment [Brochure]. Bathurst, New Brunswick: Author.

Brown, R. L., Flavin, C., & Postel, S. (1991). Saving the planet. New York: W.W. Norton.

Bruce, J., & Mitchell, B. (1995). Broadening perspectives on water issues (Canadian Global Change Program Incidental Report Series No. IR95-1, ISSN 1192-6481). Ottawa: The Royal Society of Canada.

Bryan, R. (1972). Much is taken, much remains. Scituate, Mass: Duxbury Press.

Canadian Round Tables. (1993). Building consensus for a sustainable future: Guiding principles (ISBN 1-895643-24-4). Ottawa: Author.

Canadian Water Resources Association. (1994). Sustainability principles for water management. Toronto: Author.

Cardy, W. F. G. (1983). River basins and water management in New Brunswick. In B. Mitchell, & J. S. Gardner (Eds.). River basin management: Canadian experiences (Department of Geography Publication Series, No 20) (pp. 61-70). Waterloo, Ontario: University of Waterloo, Department of Geography, Faculty of Environmental Studies.

Carley, M., & Christie, I. (1993). Managing sustainable development. Minneapolis, MN: University of Minnesota Press.

Charlton, D. L., & Tufgar, R. (1991). Integrated watershed management approach for small southern Ontario rural/urban watersheds. Canadian Water Resources Journal, 16 (4), 421-432.

Christenson, J., & Robinson, J. (1980). Community development in America. Ames, Iowa: Iowa State University Press.

Conrad, M., Finkel, A., & Jansen, C. (1993). History of the Canadian peoples. Mississauga, Ontario: Copp Clark Pitman.

Cote, R. P. (1993). Management of costal water quality and use problems in Canada. Canadian Water Resource Journal, 18 (4), 385-397.

deGroot, R. S. (1992). Functions of nature. Amsterdam: Wolyers-Noordhoff.

Dejardins, L. (1981). Integrating resources. Proceeding of the Canadian Parks and Recreation 36th Annual Conference, 84-106.

de Loe, R. C. (1990). Strategies for coordinating water management: A multi-jurisdictional survey. Innovations in river basin management: Proceedings of the 43rd annual conference of the Canadian Water Resources Association, 93-105.

DePape, D. (1985). Federal-provincial co-operation in water - An exploratory examination. (Inquiry on Federal Water Policy, Research Paper # 9). Ottawa: Environment Canada.

Department of Municipal Affairs and Environment. (1988, May). Discussion paper - water management issues and a clean water act. (Available from New Brunswick Department of the Environment, Land and Water Planning Section, P. O. Box 6000, Fredericton, New Brunswick, Canada E3B 5H1).

Dorcey, A. H. J. (1990). Water in sustainable development: Implications for innovation in river basin management. Innovations in river basin management: Proceeding of the 43rd annual conference of the Canadian Water Resources Association, 17- 26.

Dorcey, A. H. J. (1992). Sustainable development principles for water resources management in Canada: Towards a new consensus. Resolving conflicts and uncertainty in water management: Proceedings of the 45th annual conference of the Canadian Water Resources Association, 1.1-1.9.

Dovers, S. R. (1990). Sustainability in content: An Australian perspective. Environmental Management, 14 (3), 297-305.

Dovers, S. R., & Handmer, J. W. (1992). Uncertainty, sustainability and change. Global Environmental Change 2, (4), 262-276.

Downs, A. (1972) Up and down with ecology: The 'issue attention' cycle. Public Interest, 28, 38-50.

Dykeman, F. W. (1986). A return to the past for rural community-based planning and action programme for the future: A challenge for planners. Paper presented at the Canadian Institute of Planners Conference, Vancouver, BC.

Eastern Charlotte Waterways. (1994). By-Laws of the Eastern Charlotte Waterways Inc. (Available from Eastern Charlotte Waterways, 17 Main St., St. George, New Brunswick, Canada E0G 2Y0).

Eastern Charlotte Waterways. (1997). The watersheds of Eastern Charlotte: Environmental quality assessment. St. George, New Brunswick: Author.

Elkin, T.J. (1990). State of the environment reports and national conservation strategies. Alternatives, Vol. 16, No. 4, 52-62.

Environment Canada. (1987). Federal water policy. Ottawa: Environment Canada.

Environment Canada. (1991). A report on Canada's progress towards a national set of environmental indicators (SOE Report No. 91-1, ISBN 0-662-18394-0). Ottawa: National Printers.

Environment Canada. (1992). Canada's national report (ISBN 0-662- 19035-1). Ottawa: Author.

Everitt, R. R., Birdsall, D. A., Stone, D. (1986). The Beaufort environmental monitoring program. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.251-267). Calgary: University of Calgary Press.

Fellows, E. S. (1969). Presentation by the New Brunswick Water Authority. In University of New Brunswick. Proceedings of the colloquium on water resources research in the Atlantic region (pp. 29-33). Fredericton, New Brunswick: University of New Brunswick.

Foster, H. D., & Sewell, W. R. D. (1981). Water: The emerging crisis in Canada. Ottawa: Canadian Institute for Economic Policy.

Goodman, A. (1984). Principles of water resources planning. NJ: Prentice Hall.

Government of Canada. (1990). Canada's green plan (ISBN 0-662-18291-X). Ottawa: Minister of Supply and Services Canada.

Glover, E. A. (1996). A comparison of the Atlantic Coastal Action Program (ACAP) and the Provincial New Brunswick Sustainable Development Program: Lessons for future coastal zone management initiatives. Unpublished master's thesis, Dalhousie University, Halifax, Nova Scotia, Canada.

Government of New Brunswick. (1990). Clean water act. Ottawa: Queen's Printer for New Brunswick.

Grumbie, R. E. (1994). Wilderness, wise use and sustainable development. Environmental Ethics 16 (3), 227-249.

Gunn, C., Gunn, H. D. (1991). Reclaiming Capital: democratic initiatives and community development. London: Cornell University Press.

Haith, D. A., & Loucks, D. P. (1976). Multiobjective water-resources planning. In A. K. Biswas. (Ed.). Systems approach to water management (pp. 365-397). New York: McGraw-Hill.

Holy, M. (1982). Environmental aspects of water management. In P. Laconte, & Y. Y. Haimes (Eds.). Water resources and land-use planning a systems approach (pp. 69-91). The Hague: Martinus Nijhoff Publishers.

Issac, S., & Michael, W. B. (1979). Handbook in research and evaluation. San Diego: Edits Publishers.

Jacobs, P., & Fenge, T. (1986). Integrating resource management in Lancaster Sound: but on whose terms? In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.267-292). Calgary: University of Calgary Press.

Jantsch E. (1972). Technological planning and social futures. New York: Halsted Press.

Khalid, M. (1989). The place of nature management and sustainable development in the Bruntland report. In W.D. Verwey (Ed.). Nature management and sustainable development: Proceedings of the International Congress (pp. 11-17). Amsterdam: IOS.

Kernaghan, K. (1994). Partnerships and public administration: Conceptual and practical considerations. *Canadian Public Administration* 36 (1), 57-76.

Kinder, J. (1988). System analysis and water resources planning. In IFAC, Systems analysis applied to water resources (pp. 115- 121). Rabat, Morocco: Author.

Kreutzweiser, R. D. (1991). Water resource management: Canadian perspectives and the Great Lakes water levels issue. In B. Mitchell (Ed.). Resource management and development (pp.153-179). Toronto: Oxford University Press.

Krueger, R. P., & Mitchell, B. (1977). (Eds.). Managing Canada's renewable resources. Toronto: Methuen.

Kuffner, U. (1993). The World Bank approaches and experience with integrated water resources management. Canadian Water Resources Journal, 18 (1), 61-65.

Lamoureux, H., Mayer, R., & Panet-Raymour, J. (1989). Community action. Montreal: Black Rose Books.

Lang, R. (1986). Achieving integration in resource planning. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.27-51). Calgary: University of Calgary Press.

Loomis, J. B. (1993). Integrated public lands management. New York: Columbia University Press.

Mactavish, J. S. (1985). The federal role in water management. (Inquiry on Federal Water Policy, Research Paper # 15). Ottawa: Environment Canada.

Manning, E. W. (1990). Conservation strategies: Providing a vision for sustainable development. Alternatives, 16 (4), 24-30.

Manning, E. W. (1992). Changing attitudes towards environmental management (Discussion paper series No. 2). Ottawa: University of Ottawa, Institute for Research on Environment and Economy.

McBean, E., Mereu, T., Garthshore, G., Kitchen, C., & Benson, M. (1992). An integrated approach to watershed management planning for Trout Lake, Ontario. Canadian Water Resources Journal, 17 (1), 33-48.

McPhee, M. W., Wiebe, J.D. (1986). Coordinating management activities in the Fraser river estuary. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.229-251). Calgary: University of Calgary Press.

Mico, P. R. (1981). Developing your community based organization. CA: Third Party Publishing Company.

Miramichi River Environmental Assessment Committee. (1992). By-Laws of the Miramichi River Environmental Assessment Committee INC. (Available from Miramichi River Environmental Assessment Committee, P.O. Box 8, Chatham (Miramichi City), New Brunswick, Canada, E1N 3A5).

Miramichi River Environmental Assessment Committee. (1992). Summary-final report. Miramichi, New Brunswick: Author.

Miramichi River Environmental Assessment Committee. (1994). Environmental Action Plan. Miramichi, New Brunswick: ADI Nolan Davis.

Miramichi River Environmental Assessment Committee. (1997). Miramichi watershed environmental management plan: Reaching 2002. Miramichi, New Brunswick: Author.

Mitchell, B. (Ed.). (1975). Institutional arrangements for water management: Canadian experiences (Department of Geography Publication Series, No. 5). Waterloo, Ontario: University of Waterloo, Department of Geography, Faculty of Environmental Studies.

Mitchell, B. (1986). The evolution of integrated resource management. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.13-27). Calgary: University of Calgary Press.

Mitchell, B. (1987). A comprehensive-integrated approach for water and land management (Occasional Paper 1). Armidale, NSW, Australia: University of New England, Center for Water Policy Research.

Mitchell, B. (1989). Geography and resource analysis. (2nd. ed.). Essex: Longman.

Mitchell, B. (1990). Improved flying without new wings. Innovations in river basin management: Proceedings of the 43rd annual conference of the Canadian Water Resources Association (pp. 7-16).

Mitchell, B. (Ed.). (1991). Integrated water management: International experiences and perspectives. London: Belhaven Press.

- Mitchell, B. (1997). Resource and environmental management. Essex: Longman.
- Mitchell, B., & Pigram, J. J. (1989). Integrated resource management and the Hunter Valley Conservation Trust. Applied Geography, 9, 196-211.
- Mitchell, B., & Shrubsole, D. (1994). Canadian water management: Vision for sustainability. Cambridge, Ontario: Canadian Water Resources Association.
- Mitchell, B., & Shrubsole, D. (1997). Practising sustainable water management: Principles, initiatives and implications. In D. Shrubsole, & B. Mitchell (Eds.). Practising sustainable water management: Canadian and international experiences (pp. 1-25). Cambridge, Ontario: Canadian Water Resources Association.
- Naresh, S., & Titi, V. (1995). Empowerment for sustainable development: Overview of concepts, methods and challenges. In S. Naresh & V. Titi (Eds.). Empowerment for sustainable development: Toward operational strategies (pp. 6-28). Halifax, Nova Scotia, Canada: Fernwood Publishing.
- National Round Table on the Environment and the Economy, Federation of Canadian Municipalities, & Canadian Nature Federation. (1990). Sustainable development and the municipality. (Available from National Round Table on the Environment and the Economy, 1 Nicholas Street, Suite 520, Ottawa, Ontario K1N 7B7).
- Needham, R. D. (1993, September). Community sustainability: Philosophy, tenants, models and criteria. Paper presented to Canadian Studies Program, University of Waterloo, Ontario, Canada.
- Needham, R. D., Jedyneck-Copley, M. (1989). The United Nations regional seas program: General guides and principles. Canadian Water Resources Journal, 14 (2), 37-58.
- Nelson, J. G., & Eidsvik, H. E. (1990). Sustainable development, conservation strategies and heritage. Alternatives, 16 (4), 62-71.
- New Brunswick Department of Fisheries and Aquaculture. (1992). The New Brunswick sustainable development project [Brochure]. Fredericton, New Brunswick: Author.
- New Brunswick Department of Fisheries and Aquaculture. (1995). Sustainable development projects/networks terms of reference. (Available from the Author, P.O. Box 6000, Fredericton, New Brunswick, Canada E3B 5H1).
- New Brunswick Department of The Environment Land and Water Planning Section. (1992). A river classification system for New Brunswick: A review of water classification systems in other jurisdictions. (Available from New Brunswick Department of the Environment, Land and Water Planning Section, P. O. Box 6000, Fredericton, New Brunswick, Canada E3B 5H1).
- New Brunswick Department of The Environment Land and Water Planning Section. (1993). A river classification system for New Brunswick: An overview of the proposed system. (Available from New Brunswick Department of the Environment, Land and Water Planning Section, P. O. Box 6000, Fredericton, New Brunswick, Canada E3B 5H1).

New Brunswick Department of The Environment Land and Water Planning Section. (1995). River Classification: Protecting lakes and rivers in New Brunswick. (Available from New Brunswick Department of the Environment, Land and Water Planning Section, P. O. Box 6000, Fredericton, New Brunswick, Canada E3B 5H1).

New Brunswick Department of The Environment Land and Water Planning Section. (1996). Protecting Outstanding Lakes and Rivers: A river classification system for New Brunswick. [Brochure]. Fredericton, New Brunswick: Author.

Neuman, W. L. (1994). Social research methods (2nd ed.). Boston: Allyn and Bacon.

O'Riordan, T. (1971). Perspectives on resource management. London, Pion.

Organization for Economic Co-operation and Development. (1988). Water resource management: Integrated policies. Paris: Author.

Orum, A. M., Feagin, J. R., & Sjoberg, G. (1991) The nature of the case study. In J.R. Feagin, A. M. Orum, & G. Sjoberg (Eds.). A case for the case study (pp. 1-26). Chapel Hill, NC: University of North Carolina Press.

Pearse, P. H., Bertrand, F., & MacLaren, J. W. (1984). Water is a mainstream issue. (Participation paper, Inquiry on Federal Water Policy). Ottawa: Environment Canada.

Pearse, P. H., Bertrand, F., & MacLaren, J. W. (1985). Currents of change. (Final Report, Inquiry on Federal Water Policy). Ottawa: Environment Canada.

Penning-Rowsell, E. C. (1993). Facilitating inter-disciplinarity: The major challenge for water management researchers and educators. Canadian Water Resources Journal 18 (4). 399-407.

Pentland, R. L. (1983). A federal perspective on river basin management. In B. Mitchell, & J.S. Gardner (Eds.). River basin management: Canadian experiences (Department of Geography Publication Series, No 20) (pp. 71-83). Waterloo, Ontario: University of Waterloo, Department of Geography, Faculty of Environmental Studies.

Pinkerton, E. (1989). Attaining better fisheries management through co-management prospects, problem and propositions. In E. Pinkerton (Ed.). Co-operative management of local fisheries: New direction in improved management and community development (pp. 3-33). Vancouver: University of British Columbia Press.

Percy, D. R. (1984). Appendix D: Federal/Provincial jurisdictional issues. In H. I. Rueggeber, & A. R. Thompson (Eds.). Water law and policy issues in Canada (pp. 2-10). Vancouver, British Columbia: Westwater Research Centre.

Petts, G., & Calow, P. (1996). (eds.). River restoration. Cambridge, Mass: Blackwell Science.

Postel, S. (1993). Facing water scarcity. In L. R. Brown et al, State of the world 1993 (pp. 22-41). New York: W. W. Norton.

Premier's Round Table on Environment and Economy. (1990). A proposed sustainable development strategy for New Brunswick. Draft copy.

Priscolli, D. J., Homenuck, P. (1986). Consulting the publics. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.67-81). Calgary: University of Calgary Press.

Quinn, F. (1977). Notes for a national water policy. In R. R. Krueger, & B. Mitchell (Eds.). Managing Canada's Renewable Resources (pp. 226-238). Toronto: Methuen.

Reed, M. G. (1995). Cooperative management of environmental resources: A case study from Northern Ontario, Canada. Economic Geography 71 (2), 132-149.

Robinson, J. E., & Anderson, M. (1985). The role of water demand management in a federal water policy. (Inquiry on Federal Water Policy, Research Paper # 20). Ottawa: Environment Canada.

Robinson, J., Francis, G., Legge, R., & Lerner, S. (1990). Defining a sustainable society: Values, principles and definitions (working paper). Waterloo, Canada: University of Waterloo, Department of Environment and Resource Studies, and Centre for Society, Technology and Values.

Rueggeberg, H. I., & Thompson, A. R. (1984). Basic water law in Canada. In H. I. Rueggeberg & A. R. Thompson (Eds.). Water law and policy issues in Canada (pp. 2-10). Vancouver, British Columbia: Westwater Research Center.

Ruitenbeek, H. J. (1991)a. Towards new fundamentals (ISBN 0-662-19136-6). Ottawa: Canadian Environmental Advisory Council.

Ruitenbeek, H. J. (1991)b. Indicators of ecologically sustainable development: Towards new fundamentals (ISBN 0-662-19136-6). Ottawa: Canadian Environmental Advisory Council.

Sadler, B. (1986). Impact assessment in transition: A framework for redeployment. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp.99-133). Calgary: University of Calgary Press.

Sadler, B., & Jacobs, P. (1990). A key to tomorrow: On the relationship of environmental assessment and sustainable development. In P. Jacobs, & B. Sadler (Eds.). Sustainable development and environmental assessment: Perspectives on planning for a common future (pp. 3- 31). Quebec: Canadian Environmental Assessment Research Council.

Savory, A. (1988). Holistic resource management. Covelo, California: Island Press.

Scott, A., Olynyk, & Renzetti, S. (1986). The design of water-export policy. In J. Whalley (Research Coordinator). Canada's resource industries and water export policy (pp. 161-242). Toronto: University of Toronto Press.

Sellers, J. B. (1995). Restructuring government for empowerment and sustainable development. In S. Naresh, & V. Titi (Eds.). Empowerment for sustainable development: Toward operational strategies (pp. 56-67). Halifax, Nova Scotia Canada: Fernwood Publishing.

- Sessions, (1995). Deep ecology for the 21st century. Boston: Shambhala.
- Shrybman, S. (1986). Environmental mediation. In R. Lang (Ed.). Integrated approaches to resource planning and management (pp. 81-98). Calgary: The University of Calgary Press.
- Simon, D. (1989). Sustainable development: Theoretical construct or attainable goal? Environmental Conservation 16 (1), 41-48.
- Sjoberg, G., Williams, N., Vaughan, T. R., & Sjoberg, A. F. (1991). The case study approach in social research: Basic methodological issues. In J. R. Feagin, A. M. Orum, & G. Sjoberg (Eds.). A case for the case study (pp. 27-79). Chapel Hill, NC: University of North Carolina Press.
- Smith, W. (1993). Water 2020: Institutional and research needs. Canadian Water Resource Journal, 18 (3), 247-253.
- Stacey, C. L. (1995). The integration of heritage and sustainable development in the community context (Doctoral dissertation, University of Ottawa, 1995).
- St. John River Society. (1992). Letter patent the St. John River Society. (Available from the St. John River Society, P.O. Box 20105, Fredericton, New Brunswick, Canada E3B 6Y8)
- St. John River Society. (1993). By-Laws of the St. John River Society. (Available from the St. John River Society, P.O. Box 20105, Fredericton, New Brunswick, Canada E3B 6Y8)
- St. John River Society. (1994). The St. John: Portrait of a river [Wall Maps]. Fredericton, New Brunswick: Author.
- Sussex Fish and Game Association. (1994). Kennebecasis River project: Habitat assessment report. Sussex, New Brunswick: Author.
- Sweeney, B. (1996, August 02). Province says Miramichi not backing river watchdog. Miramichi Leader Weekend, pp. 10.
- Tate, D. (1981). River basin development in Canada. In B. Mitchell, & W. R. D. Sewell (Eds.). Canadian resource policies: Problems and prospects. Toronto: Methuen.
- Tate, D. M. (1991). Water demand management in Canada: A state-of-the-art review (Social Science Series No. 23). Ottawa: Inland Water Directorate, Water Planning and Management Branch.
- Tinney, E. R., & Van Loon, R.J. (1972). Canadian federal water resource policy. In Organization for Economic Co-operation and Development. Water management: Basic issues (pp. 85-97). Paris, France: Author.
- Thomas, J. R., & Nelson, J. K. (1996). Research methods in physical activity (3rd ed.). Windsor, Ontario: Human Kinetics.

Thornburn, G. (1990). Integrated approaches to water resource development in the practice of the international joint commission. Innovations in river basin management: Proceedings of the 43rd annual conference of the Canadian Water Resources Association, 35-43.

Trout Creek Model Watershed Committee. (1996). Kennebecasis River project: Stream enhancement projects. Sussex, New Brunswick: Todd Byers.

Trout Creek Model Watershed Committee. (1997). Kennebecasis River project: Stream enhancement projects 1996. Sussex, New Brunswick: Todd Byers.

Vaske, J. J., Decker, D. J., & Manfredi, M. J. (1995). Human dimensions of wildlife management: An integrated framework for coexistence. In R. L. Knight, & K. J. Gutzwiller. (Eds.). Wildlife and recreations: Coexistence through management and research (pp. 33-50). Covelo, California: Island Press.

Vining, J. (1990). (Ed.). Social science and natural resource recreation. Boulder, Co: Westview Press.

Warren, R. L. (1971). Truth, love, and social change. Chicago: Rand McNally & Company.

White, G. F. (1969). Strategies of American water management. Ann Arbor: University of Michigan Press.

Wileden, A. F. (1970). Community planning. Totwa, NJ: The Bedminister Press.

Wilkinson, B. W. (1986). Canada's resource industries: A survey. In J. Whalley (Research Coordinator). Canada's resource industries and water export policy (pp. 1-139). Toronto: University of Toronto Press.

Will, E. J. (1993). Integrated resource management in Canada: Enhancing the federal role in water management (Doctoral dissertation, University of Ottawa, 1993).

World Commission on Environment and Development. (1987). Our common future. New York: Oxford University Press.

Worster, D. (1995). The shaky ground of sustainability. In G. Sessions (Ed.). Deep ecology for the 21st century (pp. 417-427). Boston: Shambhala.

Yin, K. (1994). Case Study Research. London: Sage Publications.