



Integrated Environmental Management: lessons from the Trinity Inlet Management Program

Richard D. Margerum*

School of Planning, Landscape Architecture and Surveying, Queensland University of Technology, GPO Box 2434, Brisbane, Queensland 4001, Australia

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Abstract

Integrated environmental management (IEM) promotes a holistic and interconnective approach to managing environmental systems through a goal-oriented, strategic process. The literature asserts that interaction is the key to this process, but how interaction is translated into practice is less clear. In North Queensland, Australia, the Trinity Inlet Management Program has been designed to integrate the management of a marine estuary. An analysis of the approach offers lessons for practice by demonstrating how mechanisms for information exchange and joint decision making have increased coordination, and by demonstrating the potential difficulties of implementing IEM. © 1999 Elsevier Science Ltd. All rights reserved.

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Introduction

Integration is a common term used in the literature to describe more holistic and interconnective approaches to environmental management. The term appears in a number of different disciplines to describe new management paradigms, such as ecosystem management, integrated resources management, and integrated catchment management. In this article, the author uses the term integrated environmental management (IEM) to refer to this whole range of contributions.

The literature on IEM emphasizes that besides being holistic and interconnective, it must also focus on system goals through a strategic approach (Born and Sonzogni, 1995; Lang, 1986). The critical aspect of IEM is how it is put into operation. A number of authors emphasize the role of coordination and public involvement (Gilbert, 1988; Mitchell and Hollick, 1993; Moote et al., 1994; Slocombe, 1993). Margerum and Born (1995) argue that the *key* to operationalization is an interactive approach, including public participation and consensus building among a team of individuals who are the region's stakeholders. These stakeholders can include government

agencies, non-government authorities, interest groups, and others that have a stake or interest in the issues being addressed. The consensus produced by these stakeholders creates better understanding of ecological, socio-economic and political systems (Grumbine, 1994). It also produces political will, mutual understanding, and shared capital that stakeholders can use to facilitate implementation (Innes et al., 1996).

In practice, integration has been difficult to achieve because of the complexities of managing an interactive system through a broad group of decision makers. Several Australian states have forged ahead with the concept by establishing catchment management committees to promote the integrated management of natural resources on a catchment basis. Reviews of the progress of these efforts indicate that they have had some success, but there is still considerably more work required to effectively operationalize the concept (AACM and Centre for Water Policy Research, 1995; Margerum, 1996).

The Trinity Inlet Management Program (TIMP) meets the criteria of an IEM approach. It addresses an entire system and a range of interconnected biological, economic and social issues. The TIMP case is particularly interesting to examine because government participants have collaborated to produce highly coordinated decision processes. The purpose of this case study is not to evaluate the ecological and socioeconomic outcomes of the management actions in the Trinity Inlet, but to

* Corresponding author. Tel.: + 61-7-3864-4088; fax: + 61-7-3864-1809.

E-mail address: r.margerum@qut.edu.au (R.D. Margerum)

describe and analyze the approach that managers have used to operationalize an integrated approach and identify implications for other IEM efforts. The author assumes that a more integrated approach will lead to better management outcomes, because it produces a better understanding of the problem (Mitchell and Hollick, 1993; Innes et al., 1994) and greater support for implementation (Bingham, 1986; Gray, 1989). This assumption clearly requires testing through independent assessment of monitoring data and studies of Trinity Inlet, but this is beyond the scope of the research undertaken for this paper.

Methodology

The author used documents, meeting minutes and interviews to investigate the TIMP. The documents reviewed included a Management Plan, annual reports, a program evaluation, and all of the meeting minutes. The activities of each Steering Committee and Technical Committee meeting were summarized in tables to analyze: the issues discussed, previous consideration of the issue, the nature of the discussion, and the actions of the committee. The structure and operations for managing the Inlet were analyzed using an institutional analysis framework, which is described in more detail below.

The author conducted interviews with members of the Technical and Consultative Committees, and past program coordinators. All of the interviews were taped and transcribed for analysis, but interviewee names have been omitted to maintain anonymity. These sources of information are used to describe the program as it existed in late 1997, and analyze the institutional arrangements using an institutional analysis framework.¹ The analysis provides insights into the strengths and weaknesses of the TIMP institutional arrangements and implications of the case for other IEM efforts.

The trinity inlet management program

The Trinity Inlet is a natural marine and estuarine water body located in northern Queensland, bordered by the City of Cairns (Fig. 1). The Inlet is located more than 1500 kms north of Brisbane, which is the seat of government in Queensland. The Inlet provides a wide range of ecological, economic and cultural functions. It contains seven different estuarine communities, provides important breeding and nursery areas for many marine species, and is the base for one of Australia's largest fishing fleets. As a port, the Inlet is a major gateway to north Queens-

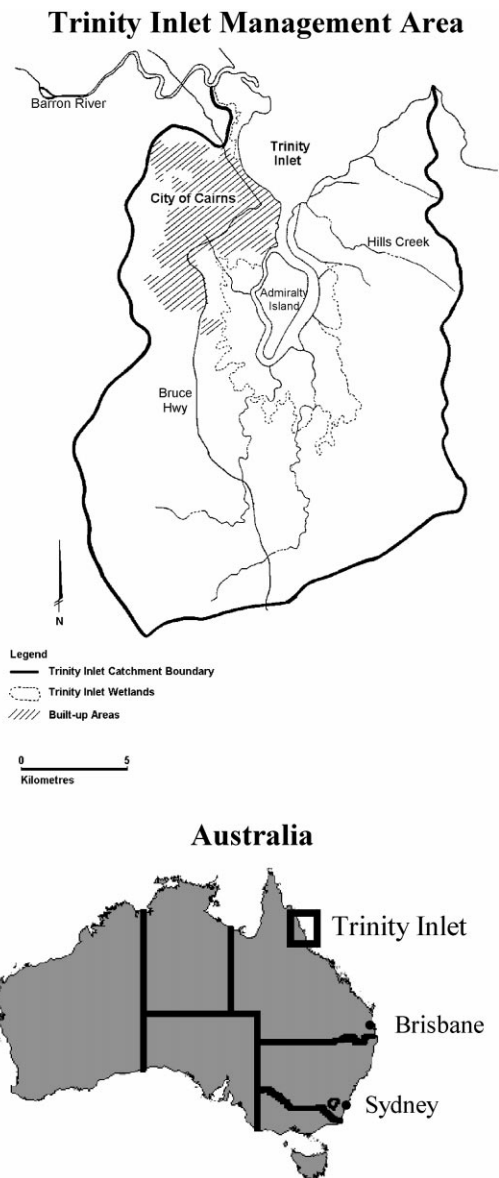


Fig. 1. Map of the Trinity Inlet.

land exports, and an important port for tourist vessels operating to the Great Barrier Reef. The Inlet's wetlands and waterways are popular areas for fishing, boating, and bird watching, and provide an important backdrop for the City of Cairns (TIMP Steering Committee 1992).

The town of Cairns was settled by Europeans in 1876, and early development pressures, such as harbor dredging and wetland filling, were small in scale. Over the past 40 years, developments in and around the Inlet have become larger and more widespread, including filling of wetlands for the Cairns Airport, reclamation of land for development, and clearing of mangroves. As the pace of the development pressures continued to increase during the 1970s and 1980s, the impacts of these decisions became more apparent. Furthermore, each of these

¹ While this article was being written, TIMP was undergoing a major review.

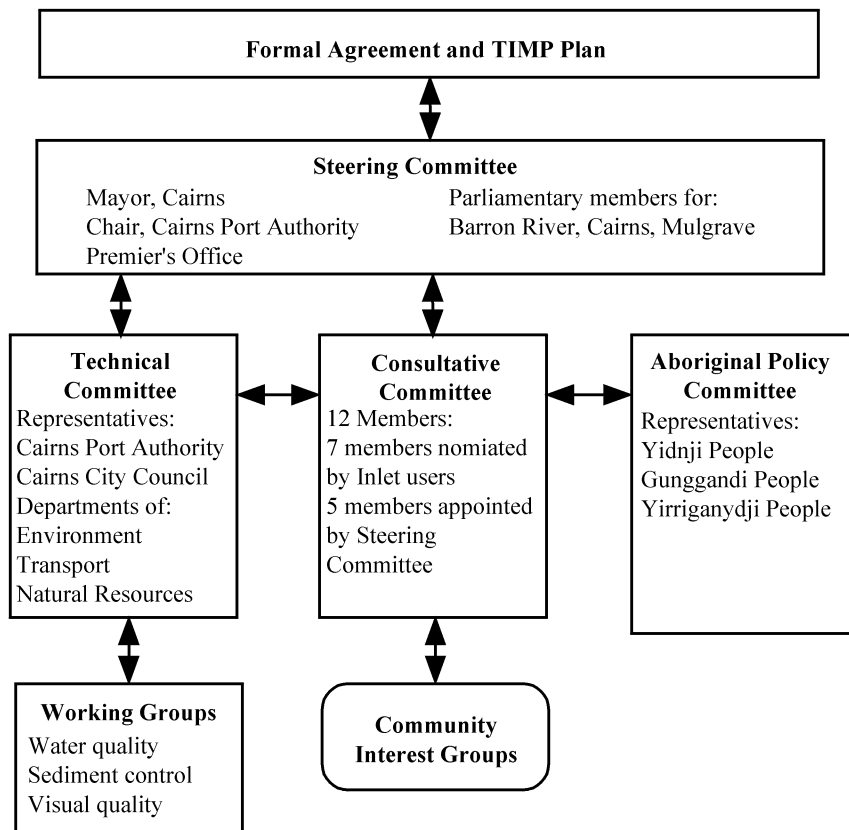


Fig. 2. Trinity Inlet Management Program Structure.

developments was being assessed in isolation, without considering the cumulative effects and the long-term impacts on the Inlet ecosystem. A 1985 development strategy for the Cairns area identified the Trinity Inlet as an issue that required detailed examination (TIMP Steering Committee, 1992). According to the interviewees, public awareness of these development impacts and the shift in economy towards nature-based tourism gradually produced momentum to address the Trinity Inlet. Environmental groups became increasingly vocal about development proposals and their impacts, and local elections in Cairns City resulted in a more environmentally concerned council.

In 1987, the Queensland Government and local governments bordering the Inlet agreed to prepare a management plan. The four participating organizations were: the Cairns Port Authority, Cairns City Council, Mulgrave Shire Council and Department of the Premier, Economic and Trade Development.² Consultants were hired to collate data, prepare a plan, and recommend management arrangements.

² The Cairns and Mulgrave City Councils were amalgamated in 1995 into the Cairns City Council. The Department of the Premier, Economic and Trade Development was the representative for all Queensland state agencies.

During the plan development process, it became apparent that a steering committee was necessary to oversee the finalization of the plan. This committee consisted of technical officers and representatives selected by the participating organizations. This consensus-based group operated parallel to the stakeholder and public consultation processes (TIMP, 1993). Overall, about 70 groups were involved in discussions about the plan throughout the process (TIMP Steering Committee, 1992).

The Steering Committee determined that a formal agreement was necessary to fulfill the plan objectives, and on 5 March 1992 the participating organizations all signed an agreement on the Trinity Inlet Management Plan (TIMP, 1993). The contractual approach of TIMP is described as the “underpinning” of plan implementation (TIMP Steering Committee, 1992).

The plan recommended changes in land tenure, changes in town planning schemes, new wetland and marine area management policies, changes in coastal management controls, new local government ordinances, new management standards and guidelines, and created the TIMP. The program consists of a program coordinator, a secretarial assistant and four committees to help implement the program and coordinate activities (TIMP Steering Committee, 1992) (see Fig. 2).

TIMP plan and funding

The TIMP Plan summarizes the values of the Trinity Inlet, provides overriding principles of management, and based on this analysis recommends primary and secondary purposes for different management areas in the Inlet. Funding for the annual operation and activities of TIMP comes from the signatory parties. The total funds allocated to the program and its projects have ranged from \$300,000 to almost \$750,000 (AUS) per year.³ For the 1995/96 fiscal year (total budget \$331,000 AUS), approximately 40% of these funds were for operational expenses, 40% was for projects, about 10% funded ongoing research, and approximately ten percent was spent on public information and awareness programs (TIMP, 1996).

Coordinator

When the TIMP was created, signatories recognized that it would be important to have a coordinator to facilitate the implementation of the strategy. The TIMP Plan defines the roles of the coordinator as: administering committee structures, acting as official Secretary for each committee, establishing management and approval systems, promoting the management plan, developing and implementing research programs, establishing systems for information transfer and community involvement. During its first five and a half years of operation, TIMP has had three different coordinators.

Steering Committee

Under the agreement for the Trinity Inlet, participating organizations are represented directly and indirectly on the Steering Committee.⁴ The Committee representatives are high-level officials, such as Mayors, agency directors, and Members of Parliament (elected state representatives). The Steering Committee meets quarterly to consider major issues in the Inlet and develop management policies across government jurisdictions. Under the conditions of the TIMP agreement, the Steering Committee is charged with the overall policy direction of TIMP, including adoption of annual programs, review of plan performance, and oversight of the technical, consultative and Aboriginal Policy Committees (TIMP Steering Committee, 1992).

Technical Committee

The Technical Committee was appointed by the Steering Committee to coordinate the day-to-day manage-

ment activities. The Technical Committee has established several working groups to support specific activities and projects. As envisioned in the Plan, the committee meets monthly to carry out four main functions. First, the committee facilitates the sharing of technical information and data. For example, it established a water quality working group to develop a joint database and information system. Second, the committee shares information about organizational programs and policies, which are important for resolving policy, conflicts and integrating management activities. overlap. For example, they developed water quality guidelines for the Inlet, which were the first to be implemented under the state's environmental protection legislation. Third, the committee manages research projects and technical studies to increase the base of knowledge about the Inlet. All three of the working groups have also been active in this role. Finally, the committee jointly reviews all use and development permits and applications that are received by the signatory organizations. Each organization maintains its approval authority and power, but the consultation process allows representatives from each organization to share data, have input, and identify potential problems (TIMP Steering Committee, 1992). Each representative takes the recommendations back to their organization, which makes the final decision. Between March 1992 and October 1997, the committee reviewed 97 different permits and applications, including: applications for development and port expansion, permits for guided boat tours, and permits for firework shows.

Consultative and aboriginal policy committees

The TIMP Plan envisioned the Consultative committee as the principal means for providing public input. It comprises 12 members representing Inlet users and special interest groups or individuals with a special knowledge or understanding of the Inlet. Seven members are nominated by Inlet users and five members are appointed by the Steering Committee. The Plan intended the Consultative Committee to "work closely with the Technical Committee, advise the Steering Committee, and bring forward issues and concerns on its own initiative" (TIMP Steering Committee, 1992, 164).

A TIMP workshop and ethnographic study led to an Aboriginal Policy Committee comprising representatives from local Aboriginal groups. In 1995, the group began meeting as a TIMP committee, but more recently Aboriginal input has been obtained through individual meetings with the TIMP Coordinator.

TIMP as an integrated approach

As noted in the discussion of Integrated Environmental Management, there is general agreement in the

³ Current exchange rate: 1 Australian dollar = approximately 0.64 US dollars.

⁴ State agencies are represented indirectly through the Premier's office.

literature about its substantive elements (holistic, interconnective, goal-oriented and strategic) as well as its procedural elements (interactive). In accordance with this definition, the TIMP case meets the criteria of an integrated approach.

Holistic and interconnective

The TIMP is holistic in its approach, addressing a full range of issues, including: fisheries, mangroves, aquatic habitat, terrestrial habitat, aesthetics, user conflicts, user safety, and development impacts. This role has also included efforts to improve the overall understanding of the system. For example, a working group has been overseeing a project to compile a relational database for water quality data and link it to a Geographic Information System (GIS). A working group member noted, “it has been quite important to get all of that data into one place, because it used to be all over the place. Everyone had a little bit of data, but no one had an overview of which data were where”.

Through the Technical Committee, TIMP also appears to have increased awareness of the interconnections among ecological systems, human activities, and management decision making. Minutes of Technical Committee meetings reveal that the committee spends considerable time reviewing and discussing the range of potential impacts from development and use applications. Committee members noted that they share information not only about data and analysis, but also organizational policies and plans.

Goal oriented and strategic

The TIMP Plan identifies goals for managing the Inlet through a Resource Allocation Plan. Technical committee members noted that the goals outlined in the Plan are quite broad, but they have helped guide committee roles and actions. Meeting minutes confirm that during discussions of permits and issues, participants referred back to the management plan for guidance.

The TIMP Plan identifies major management issues, community attitudes, values, needs, and perhaps most importantly, roles for TIMP staff and most committees. Like many IEM efforts, the breadth of TIMP has often made a strategic focus difficult to achieve. However, an articulated operational role of the Technical Committee in reviewing use and development permits appears to have helped keep activities focused. The TIMP Steering Committee has also fostered a strategic approach by requiring annual work plans, providing operational oversight, and providing policy guidance.

Building an interactive approach

Several authors argue that a critical component of operationalization is the development of an interactive

approach to management (Margerum and Born, 1995; Mitchell and Hollick, 1993; Moote et al., 1994; Salwasser, 1991). The TIMP committees and subcommittees promote a high degree of interaction at several levels, but stakeholder and public input has been somewhat marginalized. Overall, the formal and informal institutional arrangements have helped facilitate a considerable degree of information exchange and joint decision making. Because of this unique approach and the potential lessons for IEM practice, these arrangements are analyzed in detail.

Institutional analysis of the TIMP approach

The TIMP is not a perfect example of integration, but the highly specified institutional arrangements are relatively unique compared to other IEM approaches. Margerum (1999) points out that many collaborative efforts are focused on information sharing and cooperation. Less common are institutional arrangements that promote ongoing interactive decision-making. The TIMP has defined roles for most committees, processes for information exchange and decision making, and perhaps most importantly, a delegation of authority to these interorganizational efforts.

Table 1 summarizes the institutional arrangements of TIMP using an analysis framework, which is based on the public choice and institutions literature (Gregg et al., 1991; Ostrom, 1986). This framework focuses on the interorganizational components of the management institution, rather than the full extent all management activities.⁵ It uses sets of rules to describe policies, procedures, and norms of action (formal and informal) that define interorganizational activities. The important aspect of these rules is that they are regular and recognized patterns of action. The rules are divided into six categories that define the problem domain, structure, and process: scope, position, boundary, information, decision, and authority.

This analysis can be applied to several different levels in an institutional structure. For example, legislators cooperate to develop water quality legislation and policies (policy-legislative level). The administering agency develops regulations, policies and norms in applying the law (organizational level). Individual managers interact use using these rules in combination with their own procedures and norms (operational level).

⁵ Applying this framework to interorganizational coordination is a significant departure from how its intended application in the public choice and institutions literature. This analysis does not examine all aspects of an institution, but solely the interorganizational elements. The framework is based on a methodology developed by Margerum and Born.

Table 1
Coordination rules framework

	Rule category	Description
Problem domain	Scope	The Trinity Inlet ecosystem issues defined by the Trinity Inlet Management Plan (including amendments to the Plan)
Rules governing structure	Position	<p><i>Organizational</i></p> <ul style="list-style-type: none"> Steering Committee designated in Trinity Inlet Plan: Cairns Port Authority, Cairns City Council, State of Queensland <p><i>Operational</i></p> <ul style="list-style-type: none"> Technical Committee: representatives of the designated organizations Aboriginal Policy Committee: representatives of local Aboriginal groups Consultative Committee: representatives of community and Inlet users TIMP Coordinator
	Boundary	<p><i>Organizational</i></p> <ul style="list-style-type: none"> Steering Committee: Designated in the TIMP Agreement <p><i>Operational</i></p> <ul style="list-style-type: none"> Technical: Representatives of designated organizations Consultative Committees: appointed by Steering Committee (5) and Inlet users (7) Aboriginal Policy Committees: Representatives from three local communities TIMP Coordinator: appointed by the Steering Committee
Rules governing process	Information	<p><i>Organizational</i></p> <p>Steering Committee:</p> <ul style="list-style-type: none"> participants meet four times per year Committee hears recommendations of other committees Committee informs committees of policies and decisions <p><i>Operational</i></p> <p>Technical Committee:</p> <ul style="list-style-type: none"> participants meet monthly to discuss management issues participants must bring Inlet permit issues to Technical Committee for discussion participants share monitoring data <p>Consultative and Aboriginal Policy Committees</p> <ul style="list-style-type: none"> meet regularly to review TIMP actions, provide input and raise concerns Chair attends and reports to Steering and Technical Committee meetings <p>TIMP Coordinator:</p> <ul style="list-style-type: none"> notify committee members of meetings and record meeting minutes facilitate communication between committees facilitate communication between committees and applicants, public, etc.
	Decision	<p><i>Organizational</i></p> <p>Steering Committee:</p> <ul style="list-style-type: none"> decides by general consensus <p><i>Operational</i></p> <p>Technical Committee:</p> <ul style="list-style-type: none"> decides by general consensus or minority opinion refers issues to Consultative and Steering Committees <p>Consultative and Aboriginal Policy Committees</p> <ul style="list-style-type: none"> decides by general consensus or minority opinion
	Authority	<p><i>Organizational</i></p> <p>Steering Committee:</p> <ul style="list-style-type: none"> authority to appoint members of other committees authority to allocate annual budgets and work plans authority to hire and fire TIMP staff authority to amend the TIMP Plan and policies for the Inlet <p><i>Operational</i></p> <p>Technical Committee:</p> <ul style="list-style-type: none"> authority to exchange information and develop joint information sets authority to recommend actions on applications based on consistency with TIMP Plan authority to recommend new policies <p>Consultative and Aboriginal Policy Committees</p> <ul style="list-style-type: none"> authority to comment on TIMP actions and decisions authority to raise issues or concerns with TIMP committees authority to solicit public input and feedback <p>TIMP Coordinator:</p> <ul style="list-style-type: none"> authority to collect and exchange information among TIMP committees authority to exchange information between TIMP committees and the public

This analysis of the TIMP case does not examine the policy level, focusing instead on the organizational and operational levels. In the Trinity Inlet, the organizational level includes the formal and informal policies developed by entities like Cairns City Council, the Cairns Port Authority, and the Department of Primary Industries that relate to the management of the Trinity Inlet. At the operational level, staff from the Port Authority and state and local government operate under a variety of rules in carrying out their activities.

Scope

The scope or problem domain of TIMP is defined by the TIMP Plan and the Steering Committee. Meeting minutes and interviews indicate that the plan has been an important guide for TIMP jurisdiction, but the Steering Committee has actively adapted the plan to redefine TIMP jurisdiction. For example, soon after the Technical Committee was established, they were asked to comment on several applications for hovercraft, parasailing, and jetski operation. These uses raised a number of concerns, including: boating safety (Port Authority), noise (Dept. of Environment and Cairns City Council), and impacts to fisheries (Dept. of Primary Industries). The Technical Committee developed a policy addressing these operations, which was subsequently approved by the Steering Committee. Issues of scope are not always resolved in this manner, and participants noted that there were often disagreements about the issues they should be addressing.

Position and boundary

The position and boundary rules describe the parties involved in decision making and how they enter and leave those decision-making positions. The TIMP Program Coordinator position is overseen by the Steering Committee. The first coordinator was not re-hired by the Steering Committee and the second coordinator resigned. In late 1997, the Steering Committee appointed a temporary coordinator until a review of the Program could be completed. Steering Committee's oversight of the Program Coordinator is clearly important for management direction, but the high turnover of this position reveals the political nature and difficulties of the coordinator role. The coordinator essentially has supervisors from three different types of government entities (state, port authority, local), each with different goals, objectives and political concerns.

The TIMP Plan limits the Steering and Technical Committee membership to the signatory parties. Meeting minutes indicate that the Steering Committee refused proposals by two organizations to become members of Steering and Technical Committees: the Queensland Department of Housing, Local Government and Planning,

and the Combined Conservation Groups. This is a contrast to many IEM efforts, in which the stakeholder group includes a broad array of interests (Born and Margerum, 1993; Mitchell and Hollick, 1993). Instead, input into TIMP activities from other stakeholders is designed to occur through the Consultative and Aboriginal Policy Committees. The reasoning behind this structure appears to be that only the signatory parties can participate in TIMP policies and approval decisions. However, as pointed out below, TIMP may not have formal authority per se, because the TIMP Plan "is put into effect under existing legislative arrangements" (TIMP Steering Committee, 1992, xii). The effect of this structure is to place a greater burden on the information exchange processes among the committees.

Another important feature of the positions in this case is that mechanisms for information exchange and joint decision making exist at both the organizational and operational levels. In a hypothetical "non-integrated" management setting, individual policies are interpreted by individual organizations and applied independently (A in Fig. 3). As a result, there is considerable potential for conflict, overlap and management gaps. Under many IEM approaches, integration is focused at the organizational level, but operational application is left to individual organizations (B in Fig. 3). As a result, the mutual understanding and trust built up between organizations at the organizational level is not necessarily transferred to the operational level. Furthermore, the mechanisms for horizontal integration only include organizational level administrators and managers. In contrast, the TIMP institutional arrangements provide for integration at both the organizational and operational levels (C in Fig. 3). This appears to help foster a collaborative approach not only among those who are developing and refining organizational policies, but also those who are implementing them on a daily basis.

Information rules

The information rules define the procedures and norms of information exchange among position holders (committees, program coordinator) and between position holders and other interests. The meeting minutes and interviews revealed that participants have spent considerable time refining and revising these procedures to promote information flow. The most highly developed procedures are those of the Technical Committee when it considers applications for use or development in the Inlet. Proponents submit applications for the relevant approval to the organization and that organization brings the proposal to the Technical Committee. The Technical Committee considers the proposal in light of the TIMP Plan and the policies of individual organizations, discusses these issues, and makes a recommendation to the approval agencies. If the proposal is

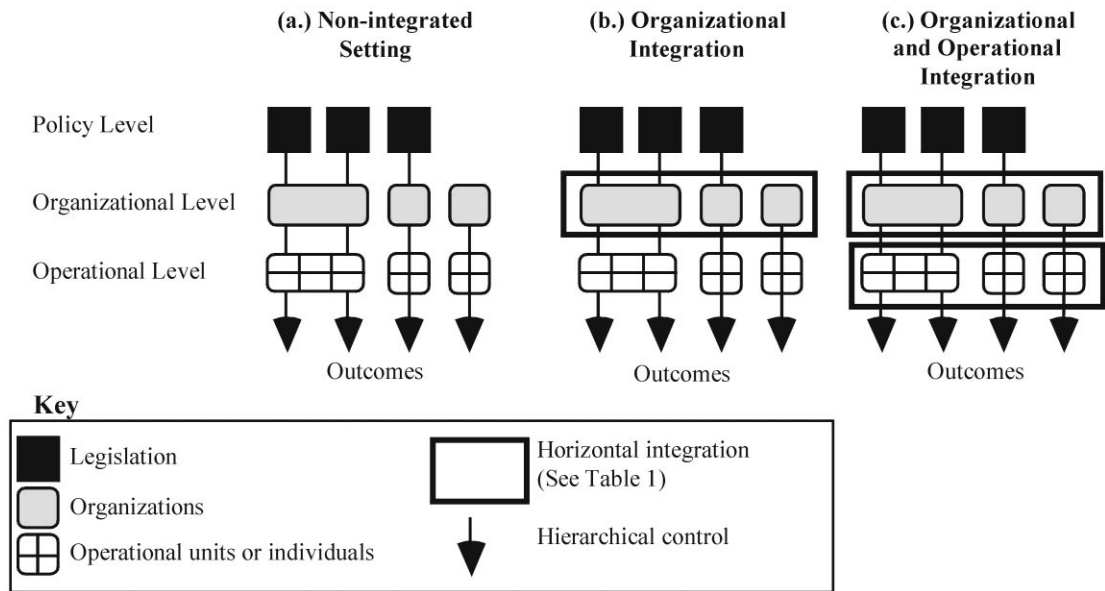


Fig. 3. Institutional Structure and Opportunities for Integration.

substantial, or involves policy issues, it is usually referred to the Steering Committee for input, direction or clarification.

Although the rules are well defined, there have still been management difficulties, including problems of distinguishing TIMP views from participant views and deficiencies in following communication protocols. While the TIMP may not have any direct authority, it has the authority to facilitate communication among entities that grant approvals, and recommend actions to those entities. However, because of early reluctance of the participants to take a stronger role in reviewing permits, participants noted that they tended to rely on TIMP to communicate decisions. This practice is confirmed by the meeting minutes. A 1995 review of TIMP found that the Program Coordinator was also being consulted directly by applicants for advice, and agency and local government staff were referring to the "TIMP approval process". The consultants suggested that these actions were producing an impression among Inlet users and applicants that TIMP had approval authority (Environment Science and Services, 1995). An interviewee who agreed with this assessment noted that "it has been viewed as another layer of bureaucracy that people have to go through". However, another interviewee believed that this was an efficient process that also ensured all proposals were brought to the committee. Efforts to clarify the TIMP role in reviewing Inlet permits and uses review have been an ongoing challenge.

Communication protocols have been another source of confusion for TIMP. Because the Consultative and Aboriginal Policy Committees are separate from the Steering and Technical Committees, effective informa-

tion exchange depends upon the program coordinator and committee chair attendance at Steering Committee meetings. On several occasions, the Consultative Committee expressed concerns to the Steering Committee that it was not being adequately informed or consulted by the other committees. The 1995 review suggested that there was confusion about the role of the Consultative Committee, and that the Technical Committee was not following consultation protocols (Environment Science and Services, 1995). The Consultative Committee's sole means of policy input is through their Chair's attendance to the Steering Committee meetings. As a result, Consultative Committee members increasingly viewed their role as a "watchdog," because they felt excluded from the decision making process. This approach, in turn, produced a negative image among some members of other committees who felt the Consultative Committee was being too critical. These tensions demonstrate the importance of effective information procedures not only for exchanging information, but also for maintaining a truly collaborative approach.

Decision rules

IEM efforts are usually based on consensus, because a collaborative approach depends upon the willing participation of individual members. As commonly noted in the literature, voting processes would undermine the intent of a collaborative process (Gray, 1989). The decision rules of the Steering committees are based on general consensus among its members. All of the other committees are considered advisory groups to the Steering Committee. To the extent possible they try to reach

consensus, but when it was not possible they present multiple perspectives to the Steering Committee. The chairs of the other committees can attend the Steering Committee to provide information, but they are not considered part of the decision making group.

These decision rules highlight that the directions and decisions for TIMP are ultimately the decisions of the Steering Committee members. All other input is advisory. Therefore, if consensus were reached on the Advisory Committee, there is no decision rule on the Steering and Technical Committees to abide by this advice. This structure provides additional explanation for why the Consultative Committee has assumed a “watchdog” role. Being excluded from the decision rule process, the Consultative committee quite naturally assumed an outsider role.

Authority rules

The authority rules summarize the coordination powers granted to the TIMP management structure by the participating agencies. It defines the coordination activities assigned to the participants, and defines the degree to which unilateral action is constrained (as well as the basis of the power to constrain). The authority rules in the case provide interesting insights into the workings of TIMP.

Authority to coordinate

The authority rules grant the TIMP committees and the coordinator the power to plan for the Inlet, establish joint policies, share information and analysis, make joint recommendations to each other about permit decisions, and carry out joint research projects. The Steering Committee has the primary authority, which it exerts through budget and work planning, the creation of procedures, and the development of the TIMP Plan and joint policies. The nuances of the Plan and joint policies are not immediately clear, but they are important in understanding the approach in TIMP.

The TIMP does not appear to influence legislation or even the formal policies of state and local organizations, but the “gray” areas of interpreting and applying legislation and policies. As Innes et al. (1994) point out, agencies often act like consensus groups, because policies are broad and open to interpretation. Different staff interpret policies differently and organizations must often reach consensus internally. Therefore, if this process of internal policy clarification is combined with interorganizational collaboration, all parties are more likely to merge towards compatible goals and management actions.

The primary means by which this merger occurs in TIMP is the Technical Committee. The authority of the Technical Committee is to exchange information, develop joint information sets, recommend action on use and development permits, and recommend new policies. This

authority, particularly, those relating to permits and policies, allows the committee to translate the gray areas into precedents and operational guidelines. Through collaboration the participants have developed a greater common understanding of the system and appear to have moved (albeit slightly) towards each other’s perspectives. Bührs (1991) suggests that this type of substantive approach is critical to effective coordination. The value of this role has not gone unnoticed, and all participants recognized the value of influencing each other’s decision making. For example, one participant noted that interaction “is particularly valuable for updates on the organizational dynamics ... internal policies and agendas ... That level of interaction becomes particularly valuable because it means that individual agencies have the capacity to sort of implement and contribute to those agendas”.

The confusion of the TIMP role also appears to have produced disagreement among TIMP participants. If interpreted narrowly, the authority of the coordinator is administration, facilitation, and publicity without the associated authority to make approval decisions. However, interviews revealed that the participating organizations relied on the Program Coordinator to assume a more substantive role. The coordinator in turn relied on the authority of the Trinity Inlet Plan to guide advice and actions. Participants indicated that this role was important in the early days of TIMP, because it reduced the pressure on individual organizations. Thus, it appears that the collective authority of TIMP was exerting a stronger role in permit review than individual organizations had been accustomed or willing to assume. A number of participants noted that the organizations were “hiding behind the mantle of TIMP”.

The disagreement about the roles, and different expectations of the coordinator’s role, appear to be major contributing factors to the high turnover in this position. Past coordinators indicated that the political pressures were a major reason why they were not re-hired or chose to resign. With each change in the coordinator position, the authority of the position and TIMP appears to have shifted more towards more of a process role. The greatest difficulty with this shift will likely be the ability of the individual parties to maintain a broad scope through the committees. Under a Program Coordinator without detailed substantive knowledge, TIMP operation will become much more dependent upon information exchange and decision processes among the participants.

Power to constrain

The authority of the institutional arrangements to constrain unilateral action is less clear. First, participants have interpreted the power of the plan differently. Some view it as a plan that spells out clear actions, priorities, and policy constraints on decision making. For example, the Technical Committee discussed issues and correspondence that referred to consistencies or

inconsistencies with the Plan. Other interviewees view it as an advisory document, which in combination with the Agreement, set out the principles and guidelines for management. These people referred to the plan as general, requiring “interpretation and flexibility” and envision greater flexibility in its implementation.

Second, the research revealed different interpretations of the power of the Trinity Inlet Management Program. The evidence from many interviews and meeting minutes suggests that the authority of TIMP and its committees is effectively binding on the participating parties. That is, as signatories to the plan and participants on the Steering and Technical Committees, the organizations are expected to abide by TIMP decisions. However, TIMP decisions appear to be only recommendations, and the authority of the jointly signed TIMP Plan is unclear. If one of the participants chooses to ignore the recommendations of TIMP, the legal sanctions for enforcement are unclear, because the standing of the jointly signed plan has never been tested. A 1997 legal opinion prepared for the Cairns City Council by MacDonnells Solicitors and Notaries (1997, 2) found “on a straightforward reading of the [Trinity Inlet] Agreement it is difficult for us to see what consideration there is flowing between the parties. If there is no consideration, the TIMP Agreement may not in fact be binding on the parties at law.” The basis of the binding authority may be most strongly influenced by moral and political obligations. For example, Technical committee meeting minutes reveal that on several occasions members were admonished for not bringing permit and applications to the committee for consideration.

Analysis and implications

This review demonstrates that the role of the Trinity Inlet Management Program has evolved over time, but it has maintained its primary role of coordinating the management of the Inlet. This role in coordinating day-to-day management has produced a greater degree of interactive decision making than many other integrated environmental management efforts researched by the author in the United States and Australia (Margerum, 1995, 1996). Therefore, it is important to not only analyze the TIMP approach, but also discuss the implications for other integrated management efforts.

Institutional structure

TIMP has a carefully detailed institutional structure with defined roles and activities. The Steering Committee handles the significant budget and policy decisions, and contains representatives with high enough standing to make those decisions. The Consultative and Aboriginal Policy Committees provide some opportunity for public input, although there are indications that their role could

be improved (e.g., direct input into decision making or better information exchange). The engine of TIMP is the Technical Committee, which appears to be the most critical institutional innovation. The Committee has a relatively well-defined role with specific procedures for collaborative decision making. The result is that individual stakeholders have agreed to limit their autonomy on use and development permits, and share it with other stakeholders. This limit on autonomy is not legally binding, but bound by operational norms and political/public pressure. The degree of adherence to this process depends upon the power of these norms and pressures. The direct benefit for these organizations is problem prevention, reduced conflict, and sharing of data to help decision making. The potential long-term benefit is better decision making because of a more informed and holistic decision process. The cost is loss of autonomous control, which some organizations may find difficult.

Commitment

TIMP initially produced a relatively high degree of commitment from its participating organizations — to an extent not achieved in many integrated management efforts. One source of this commitment is the Trinity Inlet Management Plan, which is supported by a contractual agreement that commits the signatories to implement the plan.

Another essential element is the funding commitment to the program. In contrast to many management efforts, TIMP requires each participant to commit funding upfront. The result of these contributions is that TIMP has a sum of money to allocate according to joint objectives. This helps ensure that projects and programs will not fall between organizational jurisdictions or be dropped through changes in organizational priorities.

A further indication of commitment is the degree of communication within organizations about TIMP activities. For example, several Technical Committee members held regular briefings with their administrators or elected officials. This increases the likelihood that TIMP information, policies and programs will be translated throughout the participating organizations.

However, some interviewees argue that this commitment has gradually been waning. They question whether political and administrative leaders are prepared to continue their involvement in good faith. In particular, they argue that the increasing shift in the role of the coordinator towards process is an attempt to weaken the TIMP Plan and Agreement.

Vulnerability

One important challenge to TIMP is its vulnerability to its own success. Several participants believed that when TIMP is working most effectively, the Trinity Inlet management activities and problems are at their lowest.

Several committee members and former staff believed that there was a constant potential to under appreciate the role of TIMP in coordinating activities, preventing crises, and reducing conflict. One participant believed that the recognition of the importance of TIMP was likely to continue to decline, until a major problem or conflict erupted.

Another source of vulnerability is the lack of broad-based support. Although the degree of interaction with government stakeholders is very high, interaction with non-governmental stakeholders is more limited. In particular, the separation of the Consultative and Aboriginal Policy Committees from the Steering and Technical Committees acts to isolate these groups from the major decision making processes. Researchers hypothesize that IEM efforts should include a broad cross section of stakeholders to increase understanding and improve the likelihood of successful implementation (Grumbine, 1994; Slocombe, 1993). In other Australian and US cases researched by the author, these stakeholders have been members of the primary decision-making committee. If hypotheses about stakeholder input are correct, the limited role of non-government stakeholders in the design and operation of TIMP could limit the long-term support for the program. The Consultative Committee view of their role as a “watchdog” illustrates that the program may lack support.

Complexity and cost of integration

A final implication of the TIMP case is that a truly integrated approach is complex, expensive and time consuming for the participants. Several authors note that coordination can increase the complexity of decision making and involves transaction costs (Bührs, 1991; Wood and Gray, 1991). The analysis of the TIMP case reinforces the complexity of creating an integrated framework. Participants emphasized that TIMP involves a fairly significant level of direct funding for operation, projects and programs, and considerable staff time on the part of the member organizations.

These findings suggest that the level of funding and extent of institutional arrangements may not be appropriate in all settings. A distinguishing characteristic of the Trinity Inlet is the constant pressures and demands on the region’s resources, which has required TIMP to maintain a high degree of interaction. In regions where uses and pressures are relatively low, participants may be able to rely more on information sharing or cooperative planning to facilitate compatible management approaches.

Concluding comments

The TIMP case study provides a snapshot of the structure and approach that one set of stakeholders have

developed to operationalize integration. Like many environmental management cases, it involves political debate and concerns about power over decision making. The TIMP approach clearly has weaknesses (notably its vulnerability and marginalization of some stakeholder input), and some question the ongoing commitment to the Program. However, the author argues that the institutional arrangements articulated by the participants have produced a more interactive management approach than many IEM settings. The institutional analysis revealed several reasons for why it is more integrated. By creating committees that operate at both the organizational and operational levels, TIMP has encouraged integration among both the strategic direction and the operational activities of the participating organizations. The clear role of the Technical Committee (defined by the authority and information rules) has helped foster a level of information exchange that is rare in most IEM efforts. Although the authority of the Plan and Program is somewhat unclear, the agreement and the norms of the Technical Committee (authority rules) has helped create a collaborative decision-making environment.

This case study also demonstrates the adaptation of an institutional analysis framework to analyze the structure and mechanisms for coordination. The framework was particularly useful for identifying a range of coordination arrangements and focusing on the regular rules, procedures and norms. This allows the researcher to identify arrangements specified in agreements and plans, as well as informal processes of information sharing and decision making that have become institutionalized over time. Furthermore, by providing categories for describing these institutional rules, the framework clarifies how people and organizations interrelate. For example, it forces the researcher to identify and specify the authority of a committee, its procedures for sharing information, and its approach to reaching decisions. The framework should be useful for other researchers interested in describing and analyzing coordination settings.

In conclusion, the case of the Trinity Inlet Management Plan offers lessons and options that can be translated to other Integrated Environmental Management settings. Ultimately, the structure of TIMP is only the mechanism for decision making; the effectiveness of the program will also have to be judged by monitoring data, the public, interest groups, and users of the Inlet.

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