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An Analysis of the Application of Best Management Practices in Collaborative Watershed Management to Community-Based Sustainable Development

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A thesis submitted to the Graduate Faculty of

JAMES MADISON UNIVERSITY &
THE UNIVERSITY OF MALTA

In

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Department of Integrated Science and Technology (ISAT) &
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List of Abbreviations

BMP	best management practice
CBSD	community-based sustainable development
CUP	community university partnership
CWM	collaborative watershed management
DAC	Development Assistance Committee of the OECD
DOE	United States Department of Energy
EC	environmental communication
ELC	European Landscape Convention
EM	DOE Office of Environmental Management
EPA	United States Environmental Protection Agency
IAP2	International Association for Public Participation
IUCN	International Union for Conservation of Nature
LMRP	Little Miami River Partnership
LSU	Louisiana State University
LTWC	Long Tom Watershed Council
OECD	Organization for Economic Cooperation and Development
SPSI	Science—Policy—Stakeholder Interface
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Program
US	United States
WCED	World Commission on Environment and Development
WSSD	World Summit on Sustainable Development

Abstract

This research seeks to determine if BMPs from CWM can inform the broader concept of CBSD. In order to answer this question, I conduct a "desk study," which involves an extensive review of the CWM literature in two areas: stakeholder participation and building trust among stakeholders. I then analyze my research to deduce BMPs for these areas of CWM. As part of this analysis, I also explore how effective environmental communication plays a fundamental role in achieving these BMPs. The culmination of this work is the production of guidelines of best practice for stakeholder participation and building trust among stakeholders in CWM, which then is applied to challenges identified in CBSD. While creating thorough guidelines of best practice is not within the scope of this research, the following seven main principles could form the foundation of such a guide: identify and involve stakeholders from the beginning, analyze stakeholder knowledge and trust, identify and prioritize goals, implement structure to monitor and assess successes, reduce gaps in stakeholder knowledge, bridge the gaps between scientists and non-scientists involved, and use effective communication strategies to achieve goals.

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Keywords

Collaborative Watershed Management, Community-Based Sustainable Development, Environmental Communication, Stakeholder Participation, Trust

1. Introduction

1.1 Objective & Methods of Research

The purpose of this research is to develop guidelines for best practice in collaborative watershed management (CWM) and to assess whether these best management practices (BMPs) could inform community-based sustainable development (CBSD). Accordingly, the primary audience for this research is any set of individuals who act as the facilitating entity of a collaborative process involving communities and environmental issues because the lack of BMPs for these processes often hinders the efforts of the facilitating entity (refer to Section 1.3.3). The methodology involves an extensive analysis of the literature and exploration of case studies and frameworks of understanding, followed by inferring and evaluating best practice guidelines in two key areas in the collaborative process: stakeholder participation and building trust among stakeholders.

This research focuses on these two key areas because they are both fundamental introductory steps in collaborative processes. Failure to involve stakeholders could cause stakeholders to view the collaborative effort as illegitimate and could reduce the overall effectiveness of the collaborative's efforts. Additionally, building trust among stakeholders is essential for reducing conflict and fostering strong relationships among stakeholders and collaborative facilitators, which in turn encourages more productive stakeholder participation and thus can increase the success of the collaborative effort.

1.2 Community-Based Sustainable Development (CBSD)

1.2.1. Introducing CBSD

The report of the World Commission on Environment and Development (WCED, 1987) defined sustainable development as "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (p. 41). The World Summit on Sustainable Development (WSSD, 2002) expanded this definition on a global scale by adopting a declaration identifying three fundamental pillars comprising sustainable development: protecting the environment and developing economy and society. However, some argue that culture should be considered as a fourth pillar in this expanded definition of sustainable development (Hawkes, 2001); Figure 1 illustrates this concept:

Figure 1. The Fundamental Pillars of Sustainable Development

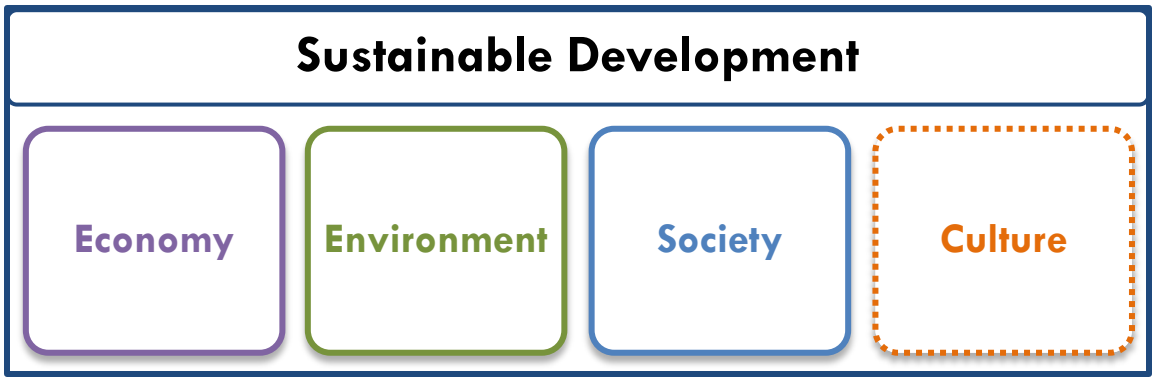

Figure 1. The fundamental pillars of sustainable development, illustrating culture as a contended fourth pillar additional to the three traditional pillars of protecting the environment and economic and social development. Adapted from *Johannesburg Declaration on Sustainable Development* (Annex to document No. A/CONF.199/20) by WSSD, 2002, New York: UN, declaration no. 5.

There are two primary approaches to interpreting what this definition implies: the "constrained growth approach" highlights the importance of economic growth, while taking environmental concerns into consideration; alternatively, the "resource maintenance approach" highlights the intrinsic value of nature and emphasizes that while economic considerations are important, the earth's resources are finite and their consumption must be curtailed (Bridger & Luloff, 1999, p. 378). Figure 2 shows a graphical interpretation of the different relationships highlighted by the two approaches to interpreting the three-pillar definition of sustainable development:

Figure 2. Conceptualizing the Relationship between the Traditional Three Pillars of Sustainable Development

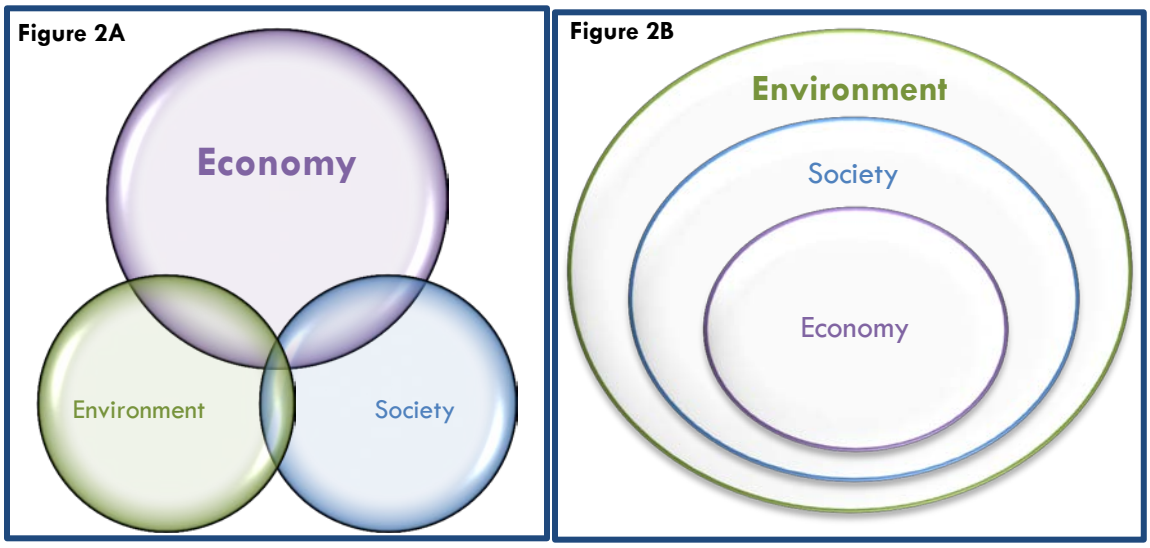

Figure 2. Conceptualizing the relationship between the traditional three pillars of sustainable development based on utilizing either the "constrained growth approach" (0A) or the "resource maintenance approach" (0B). Adapted from *the Future of Sustainability: Re-thinking Environment and Development in the Twenty-First Century* (Report of the IUCN Renowned Thinkers Meeting No. 29) by W. M. Adams, 2006, Gland, Switzerland: IUCN, p. 2.

Figure 2A highlights the "constrained growth approach" by utilizing a Venn diagram to show that economic growth is constrained by the concerns of the environment and society. On the other hand, Figure 2B utilizes concentric circles to highlight the over-arching importance of the environment and its finite nature when considering the development of society and the economy.

However, no matter which approach informs the understanding of sustainable development, trying to achieve sustainable development on a global level is problematic. A primary problem of sustainable development at such large levels of social organization is that it makes it inherently difficult for a concerted, effective political effort to effect positive change (Yanarella & Levine, 1992, p.764). Acheson (2006, p. 125) points out certain traits that doom top-down sustainable development approaches to fail, including uniform application of regulations that do not account for local variations in ecosystems, lack of interest in local knowledge or culture, and implementation of regulations that actually encourage people to take actions that detriment the survival of a resource. An example of the last type of top-down sustainable development management failure is the case of the Northwestern Hawaiian Lobster Fishery, where "a

companion use-it-or-lose-it permit provision has had the perverse effect of increasing fishing effort during times of declining stocks" (Townsend & Pooley, 1995, p. 63).

Instead, it is much more effective to focus sustainable development efforts at a community-level "where the consequences of environmental degradation are most keenly felt and where successful intervention is most noticeable" (Bridger & Luloff, 1999, p. 380). Additionally, Maser (1997) proposes that the idea of CBSD is includes shared quintessential human values, "active learning," willingness to communicate and cooperate, understanding of the relationships between humans and their environment, patience to address root causes of issues, and an overall "shared society vision that is grounded in long-term sustainability" (p. 123).

In addition, in the specific case of making the community, as a whole, more sustainable, Condon (2010, p. 15) suggests the restoration of a "streetcar city" characterized by short distances between life activities (school, work, home), frequent and efficient transportation, sustainable infrastructure, affordable and diverse housing options, and ample green spaces interspaced throughout the city. Besides the obvious benefit of achieving sustainable development, benefits of CBSD are numerous, including: autonomy, economic diversification at the local level, energy consumption reduction, conscientious waste management, safeguarding natural resources, growth of biological diversity, protection of biological and other environmental resources, and "social justice" (Bridger & Luloff, 1999, p. 381).

Therefore, not only does CBSD benefit the environment, but also it provides numerous tangible benefits to the people in the community as well. Both in the past and present, CBSD efforts, combining the elements outlined above, have proven to be more successful than larger-scale efforts; a few highlights of these numerous successes include:

- The Village Homes Development in Davis, CA (Corbett & Corbett, 2000)
- The Hamilton-Wentworth Community in Canada (Bekkering & Eyles, 1998)
- Louisiana State University (LSU)'s Community University Partnership (CUP) in Baton Rouge, LA (Livermore & Midgley, 1998)
- The Great Lakes Basin in the USA (Rabe & Gaden, 2009)

1.2.2. **The Value of Public Participation & Collaboration in CBSD**

According to Roseland (2005, p. 5), the community aspect of sustainable development relates to community capital, including human, social, natural, cultural, economic, and physical forms of capital. Therefore, CBSD encourages consumption within our means so as not to deplete our stock of community capital in any one area, in order to ensure it continues to be available in the future. Furthermore, CBSD requires mobilization of the community and its government in order to maintain and strengthen community capital (comprised of the six types of capital illustrated in Figure 3 below) (Roseland, 2005, p. 12).

Figure 3. Community Capital as "a Framework for Sustainable Community Development"

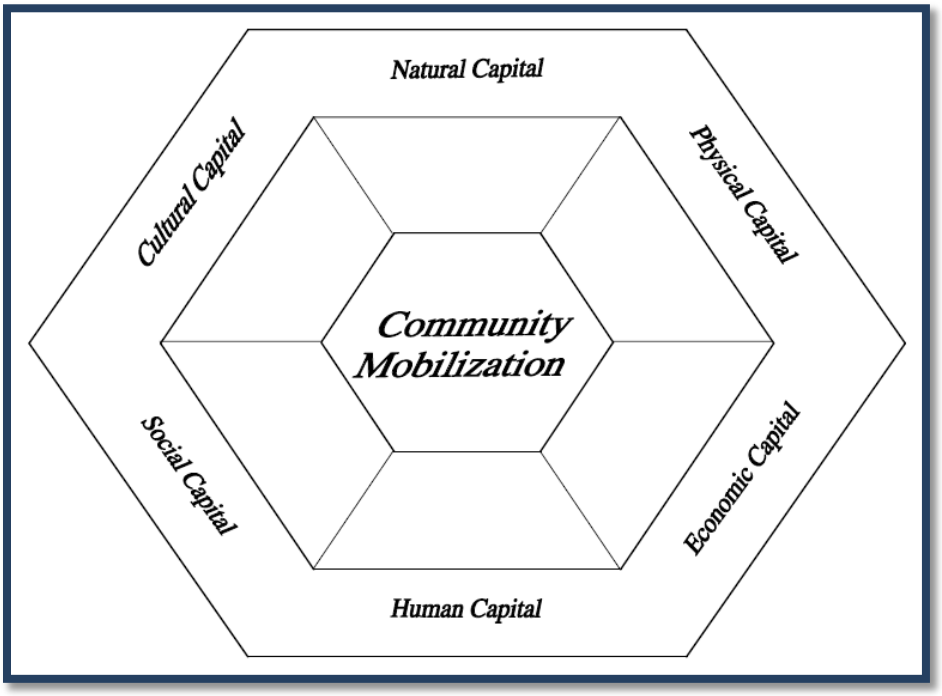

Figure 3. The six types of community capital, which form "a framework for sustainable community development." Reprinted from *Toward Sustainable Communities: Resources for Citizens and Their Governments* (Revised ed.) by M. Roseland, 2005, Gabriola Island, BC, Canada: New Society, p. 27.

One way collaboration can preserve and strengthen community capital is by using policy instruments, such as regulations, expenditures, financial incentives, and voluntary instruments to encourage equitable and sustainable use of community resources (Roseland, 2005, p. 32). Effective collaboration amongst all community members (stakeholders) through democratic public participation is a fundamental necessity in achieving effective CBSD (Roseland, 2005, pp. 26-27). However, even in the best-case scenarios, implementation of public participation efforts often fails to make the mark, as was the case in the

application of the public participation requirements of the European Landscape Convention (ELC) through initiatives in England, Norway, Slovakia, and Malta (Conrad et al., 2011, p. 23).

Figure 4. State of Public Participation Initiatives in England, Norway, Slovakia, and Malta

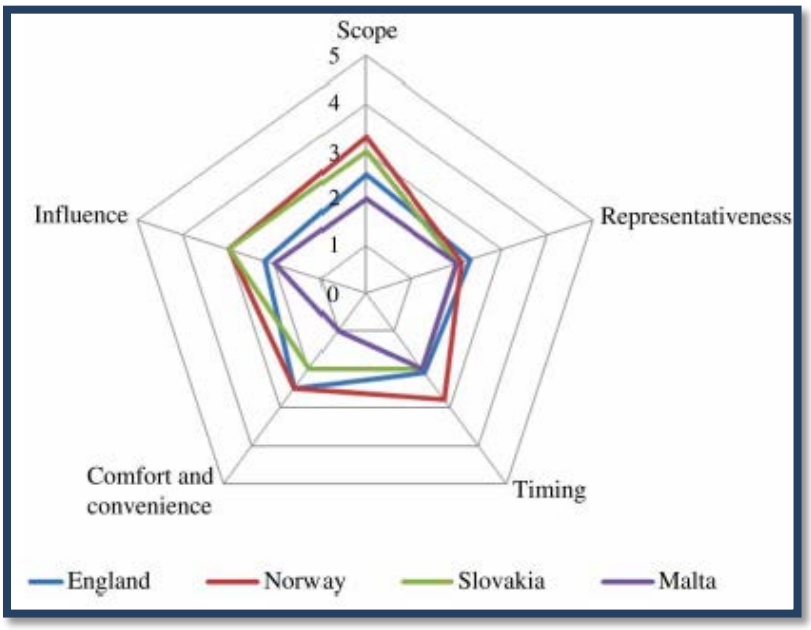

Figure 4. Evaluation of England, Norway, Slovakia, and Malta's public participation initiatives performance in five areas: scope, representativeness, influence, comfort and convenience, and timing. Reprinted from "Rhetoric and Reporting of Public Participation in Landscape Policy," by E. Conrad, L. F. Cassar, M. Jones, S. Eiter, Z. Izaovičová, Z. Barankova, M. Christie, and I. Fazey, 2011, *Journal of Environmental Policy and Planning*, *13*(1), p. 40.

Although these initiatives represented base-case scenarios in meeting the public participation requirements of the ELC, they still exhibited many weaknesses, summarized in the table below:

Table 1. Weaknesses in Public Participation of 4 ELC Initiatives

	England	Norway	Slovakia	Malta	Average	Comments
Scope	2.5	3.3	3.0	2.0	2.7	Limited to consultation with a small degree of public input
Representativeness	2.3	2.1	2.0	2.0	2.1	Few efforts made to ensure representativeness, especially in the case of marginalized groups
Timing	2.1	2.8	2.0	2.0	2.2	Public involvement usually left to end stages of the process
Comfort & Convenience	2.5	2.5	2.0	1.0	2.0	Very hard to learn about initiatives and limited opportunities to participate
Influence	2.2	3.0	3.0	2.0	2.6	Limited influence of public input as it is mostly used to enhance the opinions of experts

Table 1. Performance scores and weaknesses of public participation initiatives in England, Norway, Slovakia, and Malta, by evaluation area. Adapted from "Rhetoric and Reporting of Public Participation in Landscape Policy," by E. Conrad, L. F. Cassar, M. Jones, S. Eiter, Z. Izaovičová, Z. Barankova, M. Christie, and I. Fazey, 2011, *Journal of Environmental Policy and Planning*, *13*(1), pp. 35-41.

Chapter 2 highlights the importance of *effective* public participation, as well as its evolution from one-way interactions to bidirectional communication through collaborative efforts. Furthermore, it addresses the driving forces of collaboration and thus, public participation. Typically, conflict is the driving force of collaboration, particularly when that conflict leads to an impasse among stakeholders regarding policies and threatens to use vast amounts of resources in vain attempts to find a resolution (Wondolleck & Yaffee, 2000, p. 7). However, this is not necessarily so: according to the EPA (United States Environmental Protection Agency) (2008, pp. 3-2 - 3-4), driving forces can include regulatory issues (e.g. new regulations), government initiatives (e.g. cleaning up the Chesapeake Bay), and community-driven issues (e.g. increasing development pressures or protection of interests including recreational uses, drinking water, etc…). The absence of singularly influential agencies, which have the power to supersede collaborative decisions and can utilize alternative decision-making tools to address such issues, is often a factor in the success of such collaborations (Sabatier et al., 2005, p. 9).

1.2.3. **CBSD in Practice: Case Study Approaches**

CBSD is an attempt, at the community-level, to achieve sustainable development by defining the community's interpretation, vision, and plans of sustainable development. As no two communities are alike, case studies are an excellent way to understand how different CBSD efforts succeed in various areas under differing circumstances. While the characteristics of the community may differ, key lessons from exemplary communities can help provide general guidance to those pursuing CBSD initiatives.

In order to achieve the goal of CBSD, there are some key elements to success, including: a core group of visionaries with leadership skills, financial support, and an understanding that economic improvement goes hand-in-hand with environmental protection, and development of people (Hoff, 1998, p. 229). In regards to the importance of financial support, LSU's CUP in Baton Rouge, LA serves as an example that while their CBSD initiative started without financial backing, it could not have been sustained without the support from LSU; furthermore, this initiative recommends that communities seeking to pursue sustainable development work in conjunction with local universities, if present, as they often can provide financial support if the project has research or educational components and the involvement can prove

mutually-beneficial for both the university and the community (Livermore & Midgley, 1998, p. 137). Furthermore, in regards to people development, the two years it took to establish LSU's CUP serves as a reminder that relationships do not develop overnight and it takes time to build community among different stakeholders; additionally, when the community involved is poor or has declined significantly over the years, additional time is required to rebuild those relationships (Livermore & Midgley, 1998, p. 137).

While LSU's CUP illustrates the practical aspects of implementing CBSD initiatives, Judy and Michael Corbett (2000, pp. 53-59), delve into the theoretical side of sustainable development by outlining assumptions that form the basis of sustainable urban design in their book on the Village Homes Community. Corbett and Corbett state that everything in an ecosystem is interconnected and relies upon the transfer and input of energy into that ecosystem; furthermore, ecosystems that feature higher biodiversity are more resistant to natural or man-made environmental changes. Fundamentally, humans in an ecosystem must have their social and environmental needs met sustainably, as not only are humans genetically adapted for less industrialized times, but also humans shape and are shaped by their environment (2000, pp. 53-59).

Ultimately, Judy and Michael Corbett (2000, pp. 53-59) conclude that humans can adapt to environments not based on these sustainable design principles, but such adaptations could cause temporary or chronic stress if overall the ecosystem's environment remains unfavorable. In essence, Corbett and Corbett argue that based on these assumptions, the current trend of urban sprawl is unsustainable and communities should be designed more in the manner of the Village Homes community in California, which encourages an increase in population density, common areas (including gardens), and eco-friendly home designs. In other words, the Village Homes community was a community-based approached to sustainable development, in the case of urban planning.

Another successful case of CBSD is that of the Regional Municipality of Hamilton-Wentworth in Canada, where a concerted effort has led to successes in working towards the goal of the *VISION 2020* Sustainable Community initiative to "integrate the concept of sustainable development into the decision making of individuals, businesses, community groups, and government agencies by building an ethic of sustainability in all of our citizens" (Bekkering & Eyles, 1998, p. 157). Careful monitoring of 29 sustainable indicators show that the initiative is progressing towards achieving its goal; additionally, the

Hamilton-Wentworth community has served as a model to over 300 communities and agencies desiring to replicate the Hamilton-Wentworth's standard for CBSD (Bekkering & Eyles, 1998, p. 157-159). Through extensive planning, education campaigns, a variety of individual sustainability projects, new policies, and citizen involvement, Hamilton-Wentworth has spearheaded the movement towards successful CBSD (Bekkering & Eyles, 1998, p. 153).

1.2.4. **Challenges of CBSD**

Since sustainable development is an abstract idea, placing the focus at the community-level makes sustainable development more relevant to daily life and thus allows sustainable development to have "a context within which it may be validated as a process" (Yanarella & Levine, 1992, p. 769). Yet, the fact remains that CBSD derives from the abstract concept of sustainable development, which results in a lack of systemic understanding on what best practices to implement in order to achieve effective CBSD.

The fundamental issue caused by the abstractness inherent in CBSD is how to go about defining the "community" on which to base sustainable development. Kumar (2005, p. 276) states that the literature defines "community" in a myriad of ways and therefore finds it more suitable to examine the evolution of the use of "community," rather than its changeable definition. Kumar goes on to explain the evolution of the idea of a "community" gained ground after the introduction of "participatory" projects in the 1980s. Typically, the consideration of a "community" was the "lowest level of aggregation at which people organize for common efforts" although it was "often found to be ambiguous as to whether to "community" is meant to be a means or end" for the project" (2005, p. 277). Over time, the primary definitions of community were either based on defining the community "as a spatial unit, as a social structure, and [*or*] as a set of shared norms;" however, "these conceptions fail to explain the cause of these features or articulate their effect on natural resource use" (Agrawal & Gibson, 1999, p. 633). Figure 5 provides an illustration of this understanding of community:

Figure 5. "A Conventional View of the Relationship between Community and Conservation"

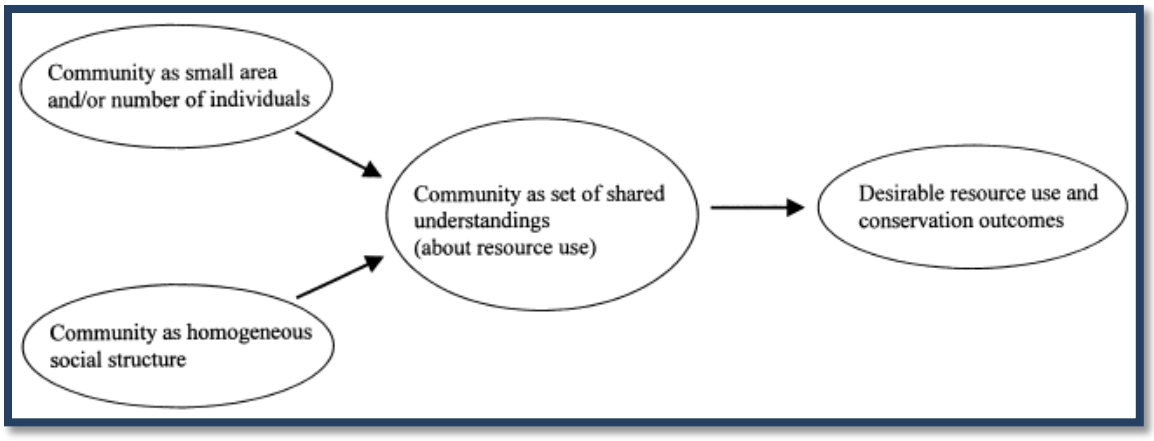

Figure 5. "A Conventional View of the Relationship between Community and Conservation." Reprinted from "Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation," by A. Agrawal and C. C. Gibson, 1999, *World Development, 27*(4), p. 636.

Kumar expands upon this viewpoint by stating "the problem is of identifying 'community' boundaries: where do they begin and end, what form do boundaries take – spatial, social, ethnic, and ideological? Who is inside and who is outside 'community' boundaries?" (2005, p. 282). Therefore, not only does CBSD face the problem of defining the community that is to serve as the basis of sustainable development, but also CBSD must identify the relationship between the community's actions and end outcomes on resource management and sustainable development. To address these conceptual issues, Agrawal and Gibson (1999) propose viewing the role of community in sustainability efforts in another light:

Figure 6. "An Alternative View of Community and Conservation"

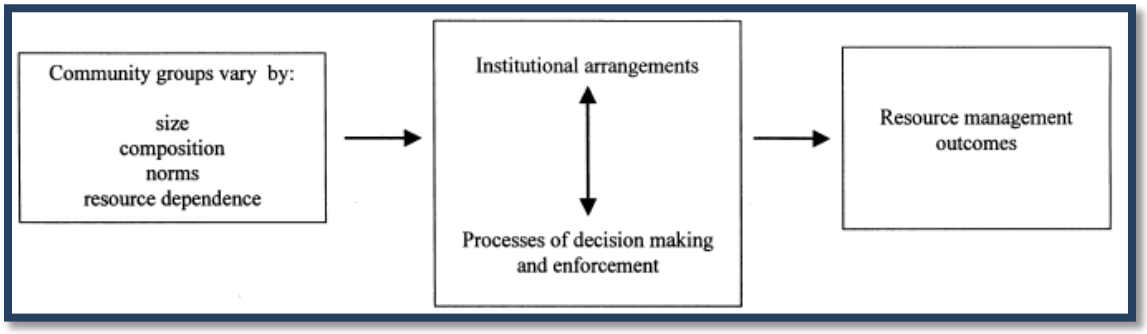

Figure 6. "An Alternative View of Community and Conservation." Reprinted from "Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation," by A. Agrawal and C. C. Gibson, 1999, *World Development, 27*(4), p. 636.

By acknowledging the inherent variability in a community's structure, as well as the function of institutions in CBSD efforts, this alternative view illustrates more completely the true nature of the relationship between communities and their role in affecting sustainable development. Leach, Mearns, and Scoones (1997) affirm that "the relationships among institutions, and between scale levels, is of central importance in influencing which social actors […] gain access to and control over local resources" (p. 12).

In an effort to propose solutions to these challenges, this research focuses on analyzing the application of BMPs from CWM to CBSD in two primary areas: stakeholder participation and building trust among stakeholders. By identifying stakeholders and analyzing their knowledge, attitudes, and relationships with other stakeholders, facilitators of collaborative efforts can more accurately define what sustainable development means specifically for its community. Furthermore, such stakeholder analysis can help further define the collaborative community within the framework of understanding illustrated in Figure 6. Such a thorough definition of the community of a collaborative not only will help anchor collaborative efforts to the community, but also will facilitate the efforts of building trust among stakeholders within the community, resulting in reduced conflict among stakeholders and increased overall success of the collaborative efforts.

1.3 Insights from CWM

1.3.1. Introducing CWM

A primary part of this research focuses on extrapolating lessons learned from various CWM partnerships and case studies to distill BMPs in CWM that can apply to CBSD as well. CWM and CBSD are related as not only do they both encourage sustainable use of resources (whether within a community or a watershed), but furthermore, they both emphasize a bottom-up approach, with a focus on stakeholder input and collaboration. In fact, it could be said that CWM is a specialized case of CBSD, since while it could potentially involve many communities (e.g. towns, cities, villages, etc…), as a whole, the community of the watershed is trying to come to an agreement through collaboration in order to sustainably use it as a resource. Therefore, since the CBSD movement in the United States (US) represents an analogous process in environmental stewardship, it is possible that best practices for CWM are exportable directly to the cultivation of sustainable communities.

In order to distill which BMPs would be most useful in addressing the aforementioned challenges in CBSD, this research analyzes the literature on CWM efforts in the areas of stakeholder participation and building trust among stakeholders. CWM serves as a lens to inform the broader concept of CBSD as there is a more extensive range of literature on a variety of aspects of watershed management, including the evolution of increased collaborative efforts in watershed management. Furthermore, the challenges of CBSD highlighted (see Section 1.2.4) parallel similar challenges in CWM: defining the watershed area managed by the collaborative, aligning the initiatives of the CWM process with the goals of stakeholders within the watershed management area, and addressing conflicts in stakeholder perceptions and goals of the CWM effort.

1.3.2. **Evolution of Collaboration in CWM**

In the past, environmental management of watersheds typically used a top-down approach, where governmental rules and regulations were created and implemented without involving all of the stakeholders in the decision-making process (Sabatier et al., 2005, p. 3). As seen in the Danish fishing industry, top-down control policies, which removed property rights from those in the fishing industry, resulted in reduced profits, increased illegal (over)fishing, and reduced adherence to by-catch and discard regulations, which often resulted in increased policy-implementation costs (Nielsen & Vedsmand, 1999, p. 25). Ultimately, top-down approaches to managing watersheds fail to escape the "tragedy of the commons" as common resources are quickly depleted ("freedom of the commons brings ruin to all") because access to a common resources compels the individuals who can access it to maximize their use of it, ultimately depleting the resource, sometimes to the point of extinction (Hardin, 1968, p. 1244). Furthermore, the movement towards collaborative approaches was fostered by the inability of top-down approaches to successfully address common watershed management issues, such as nonpoint source pollution, water quality, and habitat and species protection; top-down approaches proved ineffective as not only did they not take into account local knowledge and but also they were implemented without regard to how it would affect local citizens, making locals see the top-down approaches as illegitimate and resist implementation (Sabatier et al., 2005, p. 3)

In contrast, CWM has emerged as a participatory process that involves all stakeholders in the assessment of watershed health, in the definition of priorities, and in development and implementation of

solutions (Sabatier et al., 2005, p. 5). Furthermore, these collaboratives "act as the primary institutions for carrying out watershed planning and implementation" and "need to function effectively as organizations" (Bonnell & Koontz, 2007, p. 154). This collaborative method of managing a watershed ultimately is more effective than a top-down approach because it allows for the inclusion of local knowledge about the issue, provides the basis for more effective implementation of policies, and builds relationships among stakeholders, all of which can lead to greater success in meeting the goals for watershed health (Sabatier et al., 2005, p. 6). Importantly, solutions can represent private, voluntary action as well as public regulatory mandates. Several notable watersheds in the United States have used this strategy successfully, including:

- Lake Tahoe (Kauneckis & Imperial, 2007)
- Washington State (Ryan & Klug, 2005)
- Philadelphia's regional watersheds: Darby-Cobbs, Schuylkill, Wissahickon, Pennypack, Poquessing, Tookany/Tacony-Frankford, and Delaware (Mandarano & Paulsen, 2011)
- Susquehanna, PA (Stedman, Lee, Brasier, Weigle, & Higdon, 2009)
- Upper Sugar Creek, OH (Campbell, Koontz, & Bonnell, 2011).

All of these watersheds strive to achieve the ultimate goal of CWM: "to address environmental issues" and "to solve challenging problems that are not amenable to traditional command-and-control regulatory approaches" (Bonnell & Koontz, 2007, p. 154).

1.3.3. **Challenges of CWM**

While there is already a significant amount of research in the area of CWM, there has not been a concerted effort to analyze this research theoretically in order to distill the research findings into a comprehensive guideline of best practice. In fact, although more organizations are forming to create CWM partnerships, the lack of guidelines of best practice has hindered some of these efforts. For example, the Little Miami River Partnership (LMRP) spent much more time on planning their organizational structure than on watershed planning and "precluded efforts to understand how the partners and ordinary citizens wanted to be involved" (Bonnell & Koontz, 2007, pp. 163-164). Bonnell and Koontz (2007, p. 162) point out that the lack of a cohesive understanding of the LMRP's mission and how it would be organized and run, coupled with early creation of a board of directors comprised of primarily of with a scientific background, not only hindered participation from other stakeholder groups, but also crippled the LMRP's

ability to take tangible actions to address the key issues. BMPs for CWM, therefore, not only could streamline the process of CWM, but also could reduce the time commitment required in order to create an effective organization to succeed in CWM efforts.

Efforts to streamline the CWM process include those by the EPA (2008), which emphasizes six steps in the watershed planning and implementation process (adapted from Figure 2-1; see Appendix):

1) Build partnerships
2) Characterize the watershed
3) Finalize goals and identify solutions
4) Design an implementation program
5) Implement watershed plan
6) Measure progress and make adjustments

These steps encompass all aspects of the elements the EPA feels are necessary and important to watershed plans in order to attain positive advancements in water quality (EPA, 2008, p. 2-14 - 2-15). The EPA's *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (2008) serves as an excellent introductory guide for starting, running, and maintaining collaborative watershed management programs, especially those building programs from the ground up.

1.4 Environmental Communication

1.4.1. Introducing Environmental Communication

In order to foster collaboration, communication must be a fundamental part of the process as members of a collaborative need to be able to discuss their ideas, wants, and goals for the collaborative initiative. Environmental communication (EC) is defined as "the pragmatic and constitutive vehicle for our understanding of the environment as well as our relationships to the natural world; it is the symbolic medium that we use in constructing environmental problems and negotiating society's different responses to them" (Cox, 2010, p. 20). In other words, EC does not only encompass how we understand environmental problems in our community but also dictates how we go about solving them. Without recognizing the importance of EC, we would not be able to understand, respond to, or solve environmental issues.

EC consists of seven main areas of study, most of which are discussed in this research in some way or form as they relate to CWM and CBSD. These main areas of study include environmental rhetoric and discourse, media and environmental journalism, public participation in environmental decision-making, social marketing and advocacy campaigns, environmental collaboration and conflict resolution, risk communication, and representations of nature in popular culture and green marketing (Cox, 2010, pp. 16-19). Both Chapters 2 and 3 present tools and methods for effective collaboration in stakeholder participation and building trust among stakeholders, respectively (see Sections 2.4 and 3.4). These tools and methods then are incorporated into an overall strategy for EC (see Sections 2.5 and 3.5), which serves as the vehicle for accomplishing effective collaboration in these areas using the tools and methods described.

1.4.2. **Relationship between EC & Collaboration**

From a communication perspective, collaboration is important because it serves as a tool that allows participants to find common ground and solve problems rather than to succumb to disagreements and impasses (Cox, 2010, p. 18). From a collaboration perspective, communication is the vehicle by which collaboration occurs. Sabatier et al. (2005) details four variants of collaboration in CWM, illustrated in Table 2 below:

Table 2. Four Variants of Collaboration in CWM

Variant	Duration	Decision Power / Influence
Collaborative Partnerships	Long-term	Informal advisory
Collaborative Superagencies	Long-term	Formal authoritative
Collaborative Engagements	Short-term	Informal advisory
Collaborative Panels	Short-term	Formal authoritative

Table 2. Four variants of collaboration in CWM categorized by duration and decision power/influence. Adapted from *Swimming Upstream: Collaborative Approaches to Watershed Management* (Google Books ed.) by P. A. Sabatier, W. Focht, M. Lubell, Z. Trachtenberg, A. Vedlitz, and M. Matlock (Eds.), 2005, Cambridge, MA: MIT P, pp. 5-6, 19.

As explained by Sabatier et al. (2005, p. 19), collaborative panels and superagencies are quite uncommon, whereas collaborative partnerships are widespread; collaborative engagements serve as conflict resolution techniques in short-term collaborative efforts and include environmental mediation and collaborative learning. Even in top-down approaches to watershed management, some level of communication between the governing entity and locals is required; however, in CWM, the role of EC is crucial. Combining tools

and methods for effective collaboration into EC strategies ensures that communications among members of a collaborative is effective and enhances the success of the collaboration.

For example, EC methods are essential to dealing with conflict among stakeholders during collaborative processes. Later chapters note conflict as a potential barrier to collaboration as it can affect the quality and breadth of stakeholder participation by reducing trust among stakeholders (see Section 2.4.3). When parties collaborate to resolve conflicts, collaborative communication tactics utilized can include descriptions, disclosures, criticisms, expressions of understanding and similarity, responsibility acceptance, and solution implementation (Parker, 1997, p. 195). Furthermore, it should be noted that the process of negotiation to resolve these conflicts includes three steps: gripe time, agenda-building, and problem-solving (Parker, 1997, p. 195). Overall, addressing the issue of conflict in collaboration relies primarily on communication because the absence of effective EC among stakeholders prevents stakeholders from effectively describing their concerns and developing a plan to resolve problems amongst each other.

Systems dynamics can complement the aforementioned collaborative EC tactics. Mental models of public perceptions could be used to identify gaps in stakeholders' knowledge so that they can be fully informed to effectively participate in collaborative efforts (Lundgren & McMakin, 2009, p. 13). Furthermore, mediated modeling can be used to resolve conflicts in collaborative efforts by "establishing a shared 'big picture'" and "quantifying relationships as a way to force confrontation with the real issues" (van den Belt, 2004, p. 235). In essence, systems dynamics serves as another EC method by which stakeholders can communicate their knowledge, attitudes, and goals for a collaborative process in order to reduce conflict and enhance the success of collaborative efforts.

1.4.3. **Framework for an Environmental Communication (EC) Strategy**

In order to understand the framework use to analyze EC strategies in the following chapters, the broader context of communication, including roles, strategies, models, and tactics, needs to be explored. This research, as suggested by Cox (2010), views communication as a form of "symbolic action: the property of language and other acts to *do something* as well as literally to say something; to create meaning and orient us consciously to the world" (p. 38). Therefore, when talking about communication strategies and tactics, the implied definitions indicate that "a **strategy** is a *critical source of influence or leverage* to

bring about a desired change" while **"tactics** […] are the specific actions […] that carry out or implement the broader strategy" (Cox, 2010, p. 237).

Furthermore, models of communication and their essential elements must be explored as well. The following table utilizes the structure of Morsing and Schultz's (2006, p. 326) table outlining three corporate social responsibility communication strategies and the roles of stakeholders and corporations in those strategies. While initially developed to highlight communication strategies utilized in corporate social responsibility, these strategies can also inform environmental communication methods, including how to disseminate information between a collaborative entity and its stakeholders. Furthermore, the table utilizes updated research from James and Larissa Grunig (2006, p. 8) regarding the different models of communication and their dimensions to create a more complete examination on different models of communication for organizations. In order to create an effective environmental communication strategy in collaborative efforts, it is important to understand the various dynamics and limitations of those strategies when choosing how to facilitate communications with and between stakeholders; combining the findings of these researchers allows for a more complete illustration of the various dimension of communication models used in organizations.

Table 3. Models of Communication (Comm.) for Organizations (org./orgs.)

Dimension	Press Agentry	Public Information	Stakeholder Response	Stakeholder Involvement
Type	One-Way	One-Way	Two-Way	Two-Way
Symmetry	Asymmetric	Asymmetric	Asymmetric	Symmetric
Mediated / Interpersonal?	Neither	Neither	Mediated	Both
Ethical Basis?	No	No	Yes	Yes
Stakeholder Role	Receive info.	Receive info.	Provide requested feedback	Full involvement
Comm. Developer	Org. Management	Org. Management	Org. Management with feedback from stakeholders	Org. in conjunction with stakeholders
Comm. Goal	Favorable info. publicized about org.	Disclose accurate & favorable info. about org.	Emphasize interests of org. over those of stakeholders'	Initiate dialogue, collaboration, and participation between org. and stakeholders
Comm. Technician Role	Design favorable message about org.	Design favorable message about org.	Stakeholder identification	Building relationships between organization and stakeholders
Example (Tactics)	Press Release	Public notice / education	Surveys or focus groups	Panels and conferences involving stakeholders and org.

Table 3. Models of communication for organizations and associated dimensions. Adapted from both "Characteristics of Excellent Communication" by J. E. Grunig and L. A. Grunig, 2006, in T. L. Gillis (Ed.), *The IABC Handbook of Organizational Communication: A Guide to Internal Communication, Public Relations, Marketing, and Leadership* (pp. 3-18), San Francisco, CA: Jossey-Bass, p. 8, and "Corporate Social Responsibility Communication: Stakeholder Information, Response and Involvement Strategies" by M. Morsing and M. Schultz, 2006, *Business Ethics: A European Review, 15*(4), p. 326.

In terms of collaborative efforts, it is obvious that two-way, symmetric stakeholder involvement would be the most desired communication model to use—but why? Grunig and Grunig (2006, p. 5) explain that this model of communication is the most-likely to result in an organization (or collaborative) developing goals and taking actions in response to an issue that are in-line with stakeholder opinions and perceptions; it also aids the organization in reducing conflict and its associated negative impacts (litigation, ineffective or undesired regulations and legislation, and poor public perception of the organization). However, as seen in the strategies developed for effective communication in stakeholder participation (see Section 2.5) and building trust among stakeholders (see Section 3.5), certain one-way communication flows may be more appropriate to utilize for certain goals of the particular communication effort, such as advertising the development of the collaborative and calls for stakeholder involvement in the media.

In 1997, as a response to the failure of the implementation of sustainability efforts due to ineffective communications, the Organization for Economic Cooperation and Development (OECD)'s Development Assistance Committee (DAC)'s Working Party on Development Cooperation and Environment created an interest group on EC; the goal of this group, which consisted of members from Germany, Canada, Belgium, Switzerland, United Nations Environmental Program (UNEP), and International Union for the Conservation of Nature (IUCN), was to create a tool to assist in integrating effective communications into the process of collaborative sustainable development programs (OECD, 1999, p. 5).

Chapters 2 and 3 each discuss a strategy for EC relating to the chapter's topic using the framework developed by the OECD, summarized below:

Table 4. "10 Steps Towards an Effective Communication Strategy"

Stage	Step	
(1) Assessment	**1**	Situation Analysis and Problem Identification
	2	Actors and Knowledge, Attitude, Practices (KAP) Analyses
	3	Communication Objectives
(2) Planning	**4**	Communication Strategy Development
	5	Participation of Strategic Groups

	6	Media Selection and Mix
(3) Production	**7**	Message Design
	8	Media Production and Pre-Testing
(4) Action & Reflection	**9**	Media Performances and Field Implementation
	10	Process Documentation and Monitoring and Evaluation (M&E)

Table 4. Ten steps towards an environmental communication strategy by EC stage. Reprinted from *Environmental Communication: Applying Communication Tools Towards Sustainable Development* (Working Paper of the Working Party on Development Cooperation and Environment) by the OECD, 1999, Paris: OECD, p. 13.

While the OECD provides an excellent explanation for each step, the steps themselves are extremely generalized and built for one-way communication campaigns; although such one-way communications can be useful in a collaborative process, it is not the best structure for illustrating EC strategies that involve two-way communication methods. Therefore, in the chapters, the OECD framework is applied, adapted, and expanded into strategy that can serve as a framework for communications in collaborative efforts in the areas of stakeholder participation and building trust among stakeholders.

1.5 Research Question and Methodology

This research seeks to determine if BMPs from CWM can inform the broader concept of CBSD. In order to answer this question, I conduct a "desk study," which involves an extensive review of the CWM literature in two areas: stakeholder participation and building trust among stakeholders. I then analyze my research to deduce BMPs for these areas of CWM. As part of this analysis, I also explore how effective environmental communication plays a fundamental role in achieving these BMPs. In my concluding chapter, I present my distilled guidelines of best practice for CWM and then extrapolate how these BMPs from CWM can inform common challenges in CBSD.

This research relies heavily on certain sources, which in themselves are meta-analyses of the subject area covered. Most of these sources are THE authoritative source used by scholars as a springboard for further research in the subject area or have been cited in most of the scholarly literature in that subject area. These meta-analyses and authoritative texts are outlined in the table below:

Table 5. Meta-Analyses and Authoritative Texts Used in this Research

Source	Subject	Comments
(Cox, 2010)	EC	Comprehensive introductory text to EC
(Reed, 2008)	Stakeholder Participation	Meta-Analysis of stakeholder participation in environmental management
(Roseland, 2005)	CBSD	Comprehensive framework for understanding and applying CBSD

(Sabatier et al., 2005)	CWM	Meta-Analysis of Research on CWM
(Daniels & Walker, 2001)	Environmental Conflict	Authoritative text with meta-analysis of current literature on environmental conflict resolution
(Wondolleck & Yaffee, 2000)	Collaboration	Meta-Analysis of Research on Collaboration in Natural Resource Management

Table 5. Meta-analyses and authoritative texts used in this research.

1.6 Organization of the Research

This chapter introduces the objective of the research and the methods of analysis. It then covers a literature review that explores the pertinent theoretical research on CBSD and the elements necessary to comprehend and achieve it, including public participation, insights from CWM, and applicable aspects of environmental communication. Through exploring the theory and illustrative examples of how these elements aid in comprehending and achieving CBSD, this chapter establishes the theoretical groundwork for the examination of best practices in CWM and how they can inform CBSD.

Chapters 2 and 3 are the heart of the research as they explore two main aspects of the CWM process, stakeholder participation and building trust among stakeholders, in order to create guidelines of best practice for CWM in these areas and examine their usefulness for CBSD. For both of these aspects of CWM, this research extrapolates:

- The tools and methods for effective collaboration;
- The nature of effective communication strategies;
- How to measure success in each area; and
- How to apply the principles to CBSD

These four sub-sections serve as the end matter of both Chapters 2 and 3 in order to increase the ability to compare and contrast these aspects of the two CWM process elements.

Finally, Chapter 4 details the conclusions of the research.

2. Stakeholder Participation

2.1 Preface

Chapter 2 focuses on deriving BMPs for stakeholder participation in CWM and then analyzes the applicability of these BMPs to CBSD. *Section 2.2* provides an expanded analysis of the subject area examined previously in the literature reviewed in Chapter 1 by highlighting who a stakeholder is, the evolution of stakeholder participation, and the role of stakeholder participation in CWM. Next, *Section 2.3* presents and examines a framework to analyze stakeholder participation goals and the communication methods to achieve them.

In the second half of the chapter, I review the literature to extrapolate BMPs for stakeholder participation in CWM in the following areas:

- The tools and methods for effective collaboration *Section 2.4*
- The nature of effective communication strategies *Section 2.5*
- How to measure success in each area *Section 0*
- How to apply the principles to CBSD *Section 2.7*

2.2 Stakeholder Participation and Its Role in CWM

Sabatier et al. (2005, pp. 55-56) define a stakeholder as someone whose welfare could improve or worsen depending on the management of the watershed. Reed (2008) uses this definition for a stakeholder in his literature review of stakeholder participation for environmental management, explaining that he refers to "stakeholder participation rather than broader public participation [because] […] most conservationists focus on engaging those who hold a stake (whether directly or indirectly) in the scope of their initiative, rather than attempting to meaningfully engage with the wider public" (p. 2417). Therefore, given these two definitions, this research considers a stakeholder as any person or organization who a policy or action could potentially affect.

Cox (2010) defines public participation "as the ability of individual citizens and groups to influence environmental decisions through (1) access to relevant information, (2) public comments to the agency that is responsible for a decision, and (3) the right, through the courts, to hold public agencies and businesses accountable for their environmental decisions and behaviors" (p. 84). This definition has its basis in the proceedings of the Aarhus Convention of 1998, where these rights of the public to the

environment were developed (UNECE, 2012). The latter half of this section discusses the evolution from traditional to newer methods of stakeholder participation.

Brody (2003, p. 409) argues that in ecosystem management, where issues are often multidisciplinary, multi-party, and transboundary, stakeholder participation is the crucial element determining the success of the project as it increases trust, support, and understanding. However, Brody (2003, p. 415) notes it is not the broad representation of stakeholders that often strengthens the management plan, but rather the participation of specific stakeholders, such as NGOs and resource-based industries. Therefore, proper stakeholder identification and analysis plays a crucial role in identifying key stakeholders and ensuring their effective participation in order to increase the overall success of the project.

Reed (2008, p. 2423) includes stakeholder identification as a necessary part of any stakeholder analysis, which includes defining the system, identifying the stakeholders within that system, and prioritizing the roles of stakeholders in decision-making about that system. An essential part of this analysis includes categorization of stakeholders by either a "top-down" (researchers using an analytical system) or "bottom-up" (stakeholders themselves define themselves within self-made categories) approaches (Reed, 2008, p. 2423). Gregersen et al.'s (2007, pp. 161-164) suggestion of a variety of categories for identifying stakeholders in CWM could be part of the "bottom-up" approach to categorizing stakeholders within a watershed: local inhabitants, private and commercial users of resources, landscape transformers (on small- and large-scales), land users (both upstream and downstream), consumers of watershed products (goods and services), and organizations (environmental protection, social, government agencies, and other non-governmental agencies).

On the other hand, the thorough system of analysis proposed by Mitchell et al. (1997) is a "top-down" approach to stakeholder categorization:

Figure 7. Typology of Stakeholders Based on Identification and Salience

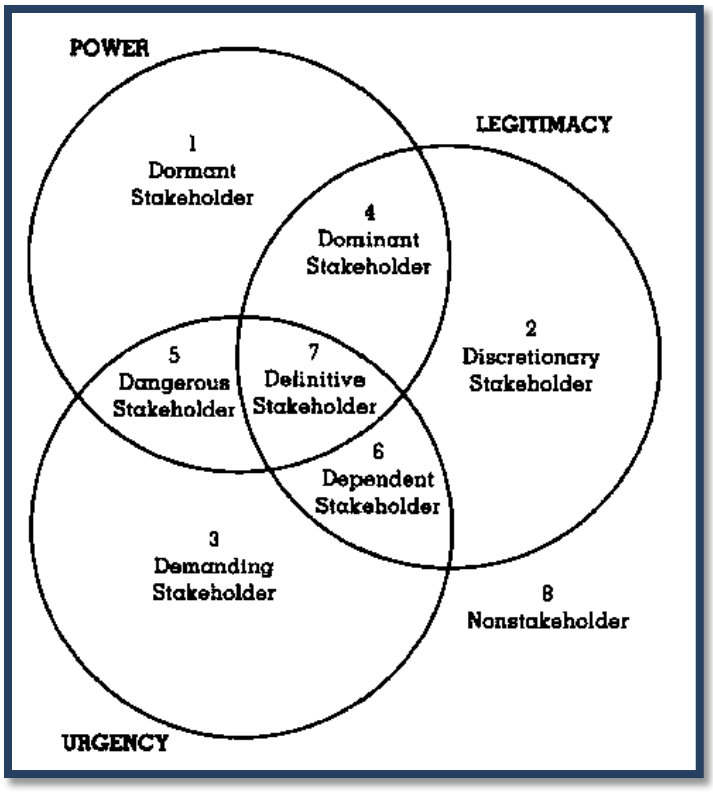

Figure 7. Eight types of stakeholders based on identification and salience of stakeholders' possession (or lack) of three defining attributes: power, legitimacy, and urgency. Reprinted from "Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts" by R. K. Mitchell, B. R. Agle, and D. J. Wood, 1997, *Academy of Management Review*, *22*(4), p. 874.

In this typology, Mitchell et al. (1997) propose eight potential stakeholder categorizations based upon their possessing one, two, or three of the defining attributes:

- **Power:** "a relationship among social actors in which one social actor, A, can get another social actor, B, to do something that B would not have otherwise done,"
- **Legitimacy:** "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed norms, values, beliefs, definitions," and
- **Urgency:** "the degree to which stakeholder claims call for immediate attention" (p. 869).

Facilitators of CWM programs need to be aware particularly of those stakeholders who have power and those who do not. Depending on the powerful stakeholders own interests, they could either unduly influence less powerful stakeholders and/or diminish their voices; certain stakeholders, such as those who

are dominant, dangerous, or demanding, may require additional attention from facilitators to manage their influence; furthermore, those who are less powerful may require additional facilitation from CWM program organizers to ensure they have the chance to effectively participate in the collaborative effort.

Overall, while stakeholders could easily fall into one or more categories described in the two approaches outlined above, categorizing stakeholders in a meaningful manner helps to identify not only if any key stakeholders are missing from the collaborative process, but also how stakeholders' interests and concerns might interact positively or negatively with those of other stakeholders. Additionally, perceptions of a stakeholder's power, legitimacy, and/or urgency can change throughout the collaborative process as stakeholders communicate with officials and each other. Therefore, as Reed (2008, p. 2423) concludes, stakeholder identification is a repetitive process amended accordingly throughout the CWM process.

Luyet et al. (2012, p. 214) point out that the primary challenge of stakeholder identification is balancing the risks between involving as many stakeholders as possible, which can increase project costs and complexity, and failing to identify all stakeholders, which could not only produce bias within the selected group of stakeholders, but also could cause a variety of negative impacts if these previously excluded stakeholders become involved with the project down the line. For example, the Third Rhone Correction Project in Switzerland prioritized stakeholder identification and the ability to incorporate new and newly identified stakeholders throughout the process over reducing the cost and time required to do so (Luyet, Schlaepfer, Parlange, & Buttler, 2012, p. 217). Therefore, in CWM, it is important to determine what risk(s) need to be addressed and prioritized based on the scope and goals of the collaborative.

Daniels and Walker (2001, pp. 157-158) point out key questions that should be asked when conducting stakeholder identification; these questions relate to identifying the parties, any special statuses accorded to any party, the parties' interests and objectives, the parties' willingness and ability to collaborate, and the levels of trust amongst parties. In cases of special status relating to Native American tribes, Cronin and Ostergren (2007, p. 527) detail several crucial factors that must be considered for effective collaboration to occur.

Questions such as these are essential not only in order to assess stakeholder knowledge, but also to assess the collaborative potential of the stakeholders in the CWM process as a whole. Walker (2004) defines collaborative potential "as the opportunity for parties to work together assertively to make

meaningful progress in the management of controversial and conflict-laden policy situations" (p. 123). Assessing collaborative potential is crucial to determining if stakeholders can work together in a CWM program or, if not, how to alter the situation in order to increase collaborative potential.

It is important to assess stakeholder knowledge about the collaborative's purpose/goals and/or background information on the issue(s) from the beginning of the collaborative process in order to identify the amount of uncertainty about these topics that exists among stakeholders. This consideration is important because the more uncertainty there is the less likely the CWM process will be effective. There are two types of uncertainty: (1) normative uncertainty, which is when stakeholders do not have a clearly defined set of goals and what actions they desire to take to achieve them and (2) informational uncertainty, which results from a stakeholder lacking the information necessary to participate fully in the collaborative process (Gooch & Stålnacke, 2010, p. 40).

In CWM, both normative and informational uncertainty play a part in "three lines of interaction: interaction between different knowledge systems (expert vs. lay; different sciences); interaction between different value positions (use vs. conservation); and interaction between different institutional arrangements (cross-sector collaboration; civil society)" (Varjopuro, Gray, Hatchard, Rauschmayer, & Wittmer, 2008, p. 151). For example, while the understanding of how various elements interact in an ecosystem is a natural thought process for biologists, other stakeholders might not realize the interconnectedness of elements in CWM; this informational uncertainty is important to consider as it can hinder the ability of stakeholders to understand how policy decisions can affect a watershed and its natural ecosystem (Daniels & Walker, 2001, p. 99). Furthermore, access to information about the CWM program and the ability to comprehend it can also cause information uncertainty, particularly if the means of obtaining and interpreting such information is prohibitive to some or all stakeholders.

The following model illustrates additional important aspects in a stakeholder analysis:

Figure 8. Interactions between Scientists and Non-Scientists in CWM

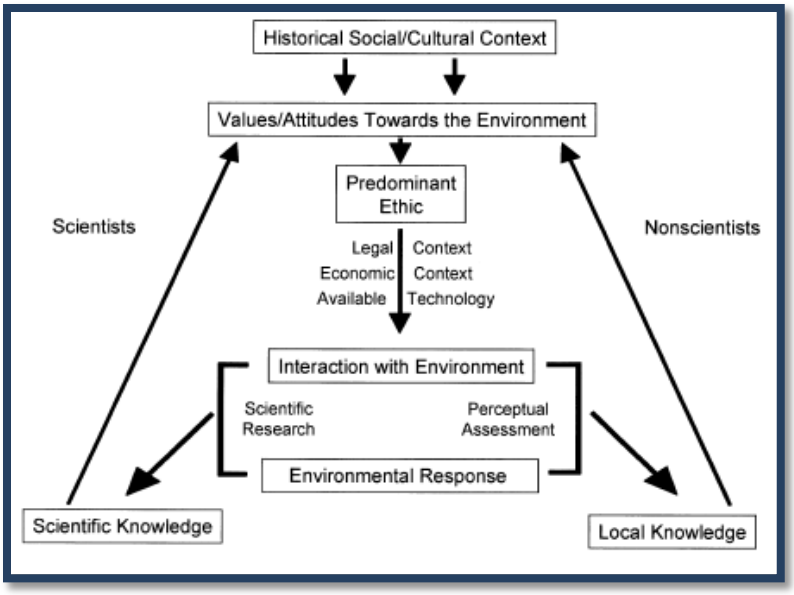

Figure 8. Representation of interactions between scientists and non-scientists in CWM. Reprinted from "Interaction between Scientists and Nonscientists in Community-Based Watershed Management: Emergence of the Concept of Stream Naturalization" by B. L. Rhoads, D. Wilson, M. Urban, and E. E. Herricks, 1999, *Environmental Management, 24*(3), p. 302.

Rhoads et al. (1999) utilize this model to illustrate the interactions between scientists and non-scientists, a "crucial" part of CWM, and includes various scientific and non-scientific parts in a specific "sociocultural" context; they represent CWM as "an unbroken cycle of interactions involving diverse actors and institutions with differing and sometimes competing agenda and stocks of knowledge" (pp. 301-302). Furthermore, the predominant community ethic shapes the approach to CWM through "defining place-based standards for human interaction with the biophysical environment" and "prevailing societal rules and resources," both of which "constrain and enable the way in which a community of stakeholders can act toward the environment" (Rhoads, Wilson, Urban, & Herricks, 1999, p. 303). Analyzing such information is crucial in not only assessing stakeholder knowledge, but also how stakeholders might interact with each other.

Traditionally, stakeholder participation in environmental management has focused on a "one-way transfer of knowledge" (e.g. town hall meetings) rather than more collaborative roles where stakeholders have a more equal footing with "knowledge producers," who typically include researchers or other experts acting as managers; however, over time, stakeholder participation has evolved to become more

collaborative "where multiple forms of expertise […] are valued in the production of knowledge" regarding an issue (Reed, 2008, p. 2426). For example, the International Association for Public Participation (IAP2) created core values for the practice of public participation, which many organizations, including the EPA, subsequently adopted (Walker, 2004, p. 118). Furthermore, IAP2 designed a spectrum of public participation to facilitate the understanding of types of public participation and their associated levels of public impact:

Figure 9. Spectrum of Public Participation

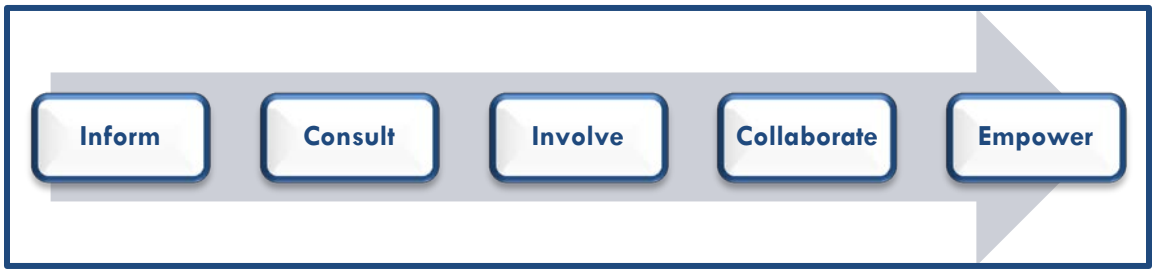

Figure 9. IAP2's spectrum of public participation. The level of public impact increases in the direction of the arrow, from left to right; therefore, public participation methods that "inform" have the least amount of public impact, while public participation methods that "empower" have the highest amount of public impact. Adapted from "the Roadless Areas Initiative as National Policy: Is Public Participation an Oxymoron?" by G. B. Walker, 2004, in S. P. Depoe, J. W. Delicath & M. A. Elsenbeer (Eds.), *Communication and Public Participation in Environmental Decision Making* (pp. 113-135). Albany, NY: State U of NY P, p. 119.

The IAP2 (2007) core values of public participation can be applied stakeholder participation in CWM: stakeholder participation efforts should facilitate the legitimate participation of all those impacted by the collaborative's action starting at the beginning of the collaborative process; furthermore, CWM programs should utilize effective communication strategies to allow stakeholders access to the information they require as well as to allow stakeholders the opportunity to influence decisions and understand the impacts of their participatory role in the process. These values highlight that the public, or more specifically for this analysis' purpose, stakeholders, are not to just be informed but actively involved in decisions in a way that their voices have some level of power to influence or inform decisions.

Another set of best practices regarding stakeholder participation comes from Mark Reed's (2008) paper, where he provided the findings from his Grounded Theory Analysis of the literature on stakeholder participation (Grounded Theory Analysis is "a qualitative method used to systematically analyze large bodies of text, to construct theoretical models that are ''grounded'' in the text" (p. 2421)). Reed

determined that "a theme running through this literature is the need replace the ''tool-kit'' approach to participation, which emphasizes selecting the relevant tools for the job, with an approach that views participation as a process" (2008, p. 2421). Furthermore, "this process needs to be underpinned by an appropriate philosophy, and consider how to engage the relevant stakeholders at the most appropriate time and in a manner that will enable them to fairly and effectively shape environmental decisions" (Reed, 2008, p. 2422). Through his comprehensive research, Reed (2008, pp. 2422-2426) derived best practices for stakeholder participation quite similar to those derived by the IAP2: collaboratives should implement stakeholder participation early in the process by conducting a thorough stakeholder analysis to ensure equal representation of stakeholders; furthermore, objectives and methods for stakeholder participation should be mutually-agreed upon by stakeholders in light of the collaborative's goals, stakeholder composition, and methods of participation in order to ensure adept facilitation of the stakeholder participation process.

In order for stakeholder participation in CWM to be meaningful and productive, the process of stakeholder participation should follow the above guidelines. This ensures that not only do stakeholders participate in the process of CWM, but also stakeholders are satisfied with the result of their participatory efforts. However, as Wondolleck and Yaffee (2000) point out in their seminal work:

> Attitudes and perceptions […] often push people apart rather than foster collaboration. These include a pervasive lack of trust, stereotyped 'us-them' images that lead to polarization, organizational norms and culture that result in conflicts even when formal missions are not in conflict, and fear of committing to a collaborative approach because it requires new and potentially risky behavior. How we think affects how we act, and our thinking is often biased against collaboration. (p. 58)

Specifically, Wondolleck and Yaffee (2000) explore three main types of barriers to collaboration and thus effective stakeholder engagement: "institutional and structural barriers," "barriers due to attitudes and perceptions," and "problems with the process of collaboration" (pp. 47-68); their thorough analysis of the subject details specific sub-categories of these problems (summarized in Table 6 below) with illustrative examples from a variety of collaboratives studied.

Table 6. Specific Barriers to Collaboration by Type

Institutional & Structural Barriers	Barriers Due to Attitudes & Perceptions	Problems with the Process of Collaboration
• Lack of opportunity/incentives • Conflicting goals and missions • Inflexible policies/procedures • Constrained resources	• Mistrust • Group attitudes about each other • Organizational norms and culture • Lack of support for collaboration	• Unfamiliarity with the process • Lack of process skills • Managing tension between the process and the world around it

Table 6. Specific barriers to collaboration categorized by type of barrier. Adapted from *Making Collaboration Work: Lessons from Innovation in Natural Resource Management* by J. M. Wondolleck and S. L. Yaffee, 2000, Washington, D.C.: Island P, pp. 47-68.

Another barrier to collaboration not specifically highlighted above is transboundary management of watersheds, which can be hindered by "insufficient local, state, and national government capacity, accountability, and legitimacy" (Daniel, Pinel, & Brooks, 2013, p. 224). However, in the case of the Spokane Valley Rathdrum Prairie Aquifer, the collaborative was able to overcome the barriers of managing a watershed over two state jurisdictions (Washington and Idaho); based on interviews, the researchers found that the two primary reasons for successful collaboration despite transboundary issues were structural (regulations required collaboration, consultation, or cooperation) and the "individuals' professional and ethical commitment to serving the public interest" (Daniel, Pinel, & Brooks, 2013, pp. 220-221). Additional barriers to stakeholder participation in collaborative efforts can include financial costs, unwillingness to compromise for ideological reasons, and insufficient time to address and resolve the aforementioned barriers to collaboration.

Many argue that "widespread public involvement is critical for environmental management;" however, "creating and sustaining widespread community involvement incurs considerable upfront costs" (Koontz & Johnson, 2004, p. 187). However, Koontz and Johnson (2004) argue that "the nature of the issue and the characteristics of the surrounding community" (p. 189) can influence what stakeholder participation approach is most effective for the specific circumstances. This is supported by their research, which found that "groups with a broader array of participants tend to excel in watershed plan creation, identifying/prioritizing issues, and group development and maintenance;" furthermore, "groups comprised of a relatively balanced mix of governmental and non-governmental participants are more likely to list planning/research and group development and maintenance results than are groups comprised primarily of

non-governmental participants" (Koontz & Johnson, 2004, p. 185). This is important to keep in mind when determining the desired level of stakeholder participation and the way to measure the successes of stakeholder participation and can reduce the financial costs of collaborative efforts by concentrating stakeholder participation efforts for more efficient participatory results.

Without stakeholder participation, watershed management would cease to be a collaborative effort. While collaboration between the science of the situation, current policies, and stakeholders (the Science—Policy—Stakeholder Interface (SPSI)) is often problematic and not clear-cut, several case studies of river basins in Asia have shown that improving the SPSI lends itself to improving stakeholder satisfaction with the participatory process as well as the results of any developed policy measures (Gooch & Stålnacke, 2010, p. 141). Furthermore, Gregersen et al. (2007, p. 63) point out that successful collaborative efforts ensure that all relevant interests are represented through a clear agenda, divide compliance responsibilities spread among various stakeholders, provide adequate funding to implement policies, and provide all stakeholders with the necessary technical knowledge to fully participate in the collaborative in order to achieve goals for multiple-uses of the watershed.

Many instances in the literature correlate increased stakeholder participation with increased success of the collaborative. Wondolleck and Yaffee (2000) state that "one simple message from many of the successful collaborative initiatives we examined is that involving the public early and often throughout a decision-making process is more likely to result in more effective decisions and produce satisfied stakeholders" (p. 103). Additionally, in examining two case studies on collaborative management of Danish fisheries, Nielsen and Vedsmand (1999) found that "multi-user group participation in co-management arrangements increases the legitimacy of decision-making" and "direct participation encourages individual members to comply with the rules;" moreover, they found that "the success of a co-management process depends heavily on the degree of commitment received from a few key persons, and is bottom-up driven" (pp. 34-35). Furthermore, Beierle (2002) shows that the more collaborative the participatory process type, the higher the level of stakeholder participation:

Figure 10. High versus Low Stakeholder Contribution by Participatory Process Type

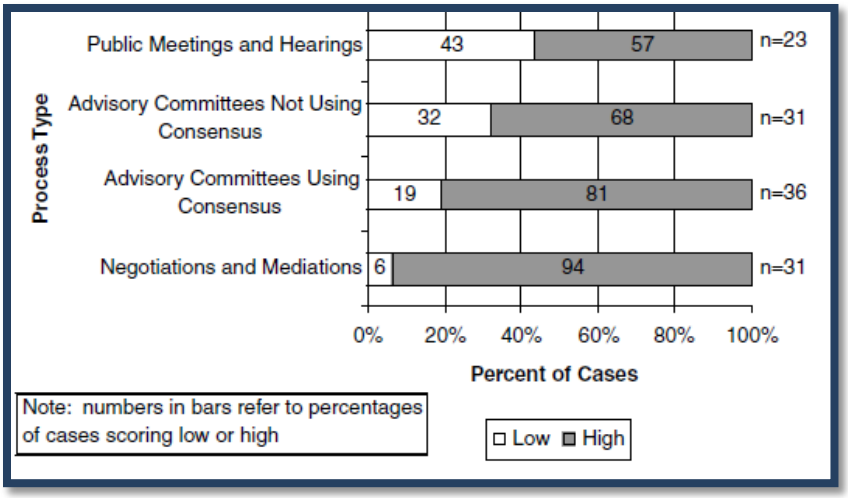

Figure 10. High versus low stakeholder contribution by stakeholder participatory process type. Reprinted from "The Quality of Stakeholder-Based Decisions" by T. C. Beierle, 2002, *Risk Analysis, 22*(4), p. 746.

Beierle (2002) concludes that "it was in the more intensive participatory processes—where stakeholders themselves had more substantial control over the process and outcomes—that they provided more input in the way of ideas, information, and analysis" (Beierle, 2002, p. 746); as seen in the table above, negotiations and mediations provided the highest percent of high stakeholder contribution (94% of cases) (Beierle, 2002, p. 746). In his research, Beierle (2002, p. 740) analyzed the quality of decisions made or influenced by stakeholders by looking at four standard aspects of quality decision-making: cost-effectiveness, mutual gains among stakeholders, insightful brainstorming, analysis, and contribution of information by stakeholders, and stakeholder accessibility to scientific information and experts. In conclusion, in his analysis of 239 case studies, Beierle (2002, p. 747) found that high quality decisions come from, and are directly related to, the amount of stakeholder participation. Overall, the literature clearly shows that effective stakeholder participation is a crucial element for successful CWM.

2.3 Stakeholder Participation Goals and the Communication Methods to Achieve Them

In order to ensure high levels of quality stakeholder participation in collaborative efforts, CWM program facilitators need to have an understanding of the nature of participatory methods. As previously discussed (see 1.4.2), communication is an essential tool used to foster collaboration. Yet, facilitators need

a systematic way of determining what communications methods to use and when. CWM programs can utilize Beierle's (1998) research to accomplish this as it not only illustrates the characteristics of different communication methods for stakeholder participation, but also presents a framework to analyze which participatory communication methods are most appropriate based on the goals the collaborative wishes to achieve.

Beierle (1998, p. 1) considers both traditional (one-way) and more collaborative (two-way) types of stakeholder participation in his development of a framework to analyze stakeholder participation methods and their effectiveness in achieving certain goals. Figure 11 below shows that while traditional stakeholder methods (groups A and C) have low to medium potential for interaction among opposing interests, the more collaborative efforts (Group B) have a much higher degree of interaction among potentially opposing interests; such a distinction between stakeholder participation methods is important to note since when there is more interaction among those who might have different interests and attitudes, there is a higher conflict potential (Beierle, 1998, p. 17). For a more in-depth discussion of conflict potential and its importance in stakeholder participation, please refer to Section 2.4.3.

Figure 11. Information Flows to Stakeholders and Their Corresponding Degrees of Interaction among Potentially Opposing Interests

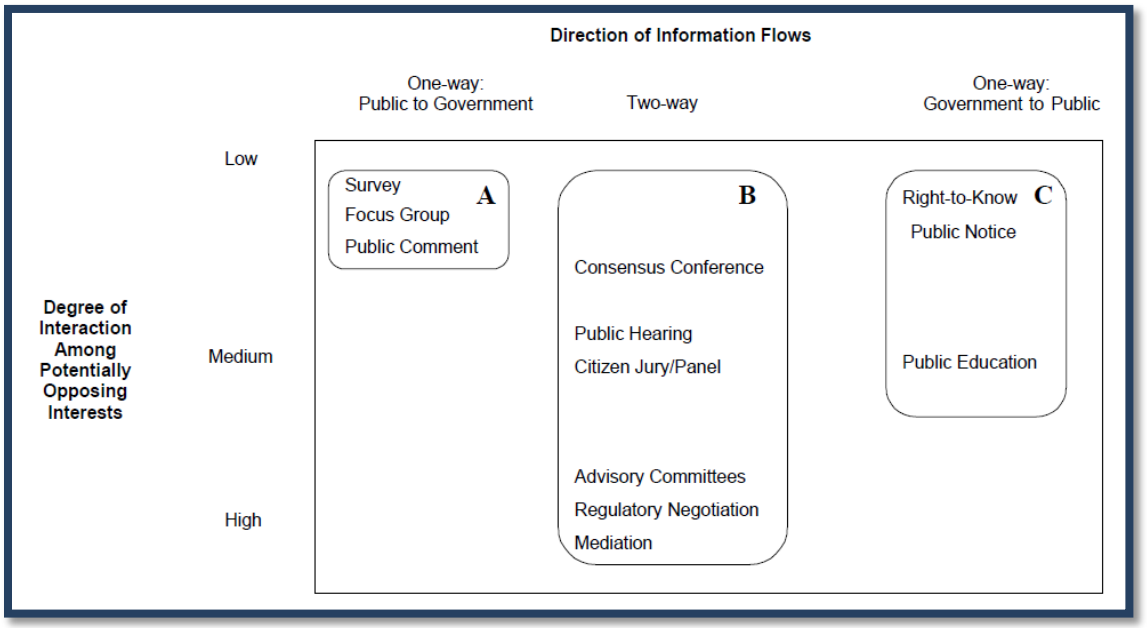

Figure 11. Information flows to stakeholders and their corresponding degrees of interaction among potentially opposing interests. Reprinted from *Public Participation in Environmental Decisions: An Evaluation Framework Using Social Goals* (Discussion Paper No. 99-06), by T. C. Beierle, 1998, Washington, D.C.: Resources for the Future, p. 17.

Beierle (1998, p. 17) then proceeds to categorize these same stakeholder participation method groups (A-C) in an alternative manner to highlight the amount of influence the stakeholder participation methods afford to stakeholders and the type of stakeholder representation that occurs. It is not surprising to see that the more traditional methods of stakeholder participation (one-way information flows of groups A and C) fail to provide stakeholders with any decision-making influence in the process. On the other hand, the more collaborative methods (Group B) of stakeholder participation not only increase the influence of stakeholders in the decision-making process, but also the more influence stakeholders have in their participatory efforts, the greater the opportunity for trust formation among stakeholders (Beierle, 1998, p. 17). For a more in-depth discussion of the role of trust in determining preferred stakeholder participation methods, please refer to Section 2.4.2.

Figure 12. Types of Stakeholder Representation and Associated Decision-Making Roles

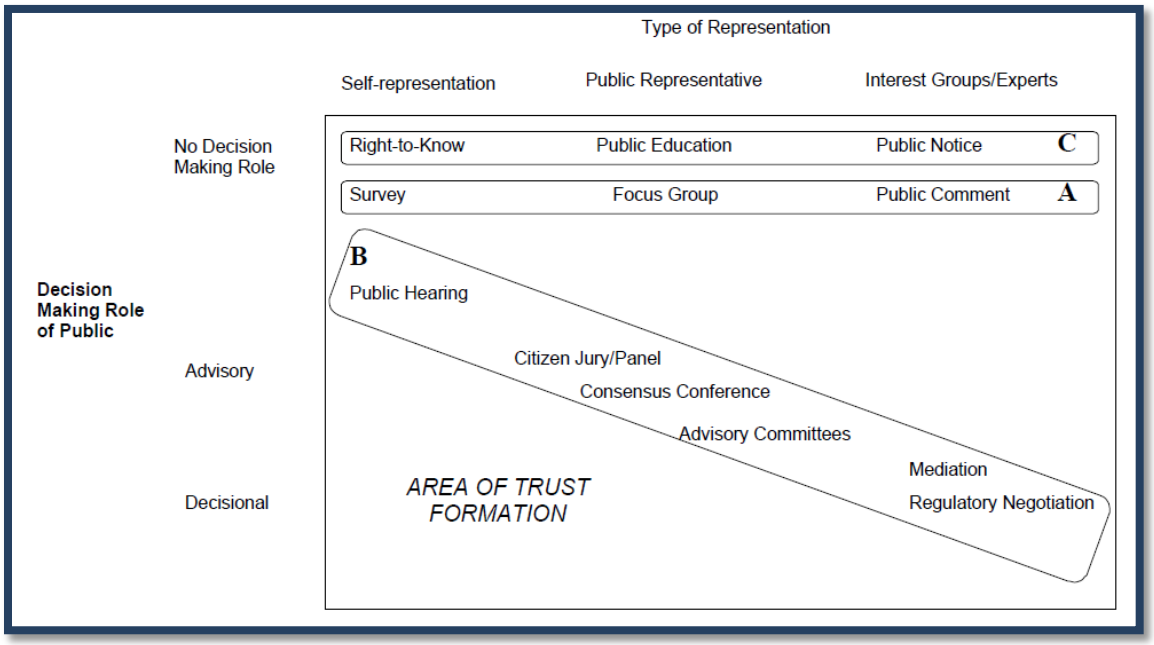

Figure 12. Types of stakeholder representation and associated decision-making roles. Reprinted from *Public Participation in Environmental Decisions: An Evaluation Framework Using Social Goals* (Discussion Paper No. 99-06), by T. C. Beierle, 1998, Washington, D.C.: Resources for the Future, p. 17.

Later in his paper, Beierle (1998, p. 19) provides an excellent matrix to serve as a framework for analyzing what types of stakeholder participatory methods are the best mechanisms for achieving the six goals Beierle identified as fundamental to environmental decision-making processes:

Table 7. Stakeholder Participation Goals and Mechanisms to Achieve Them

Mechanisms	Goal 1		Goal 2	Goal 3	Goal 4	Goal 5	Goal 6
	education	information	public values	substantive quality	trust	reduced conflict	cost-effectiveness
Non-Deliberative Mechanisms for Obtaining Information From the Public							
Survey	○	○	●	●	○	○	●
Focus group	○	○	●	●	○	○	●
N &C Rulemaking	○	○	●	●	○	○	●
Non-deliberative Mechanisms for Providing Information to the Public							
Information provision	◗	●	○	○	●	○	●
Public Notice	○	◗	○	○	◗	○	
Public education	●	◗	○	○	●	○	●
Traditional Mechanisms							
Public hearing	○	●	●	●	◗	◗	●
Citizen Advisory Ctte.	●	◗	●	●	●	●	●
Public Deliberation							
Citizen Juries/Panels	●	◗	●	●	◗	◗	●
Consensus Conference	●	◗	●	●	○	◗	●
Alternative Dispute Resolution							
Mediation	○	○	●	●	◗	●	●
Regulatory Negotiation	○	○	◗	●	◗	●	●

○ = not applicable; ◗ = may be applicable; ● = applicable

Table 7. Stakeholder participation goals and mechanisms to achieve them. Reprinted from *Public Participation in Environmental Decisions: An Evaluation Framework Using Social Goals* (Discussion Paper No. 99-06), by T. C. Beierle, 1998, Washington, D.C.: Resources for the Future, p. 19.

While all participatory communication methods achieve cost effectiveness, other methods are only effective at achieving some of the goals. It is necessary to examine completely what goals are most important to achieve through the CWM program in regards to stakeholder participation in order to determine the best communication strategies to use to achieve those goals. It is important to note that while traditional methods of stakeholder participation can be effective in achieving a few of the goals (Groups A and C as shown in Figure 11 and Figure 12), the more collaborative methods of stakeholder participation (Group B as shown in Figure 11 and Figure 12) have a greater affinity to achieving more of the goals, particularly those related to increasing trust and reducing conflict (Beierle, 1998, p. 19). Please refer to Sections 2.4.2 and 2.4.3, respectively, for an explanation as to why increasing trust and reducing conflict are crucial for effective stakeholder participation.

2.4 Tools and Methods for Effective Collaboration

While Beierle's (1998) research framework analyzing stakeholder participatory communication methods based on goals provides a foundation for effective collaboration, CWM program facilitators require a more thorough understanding of these communication methods and the tools to implement them. This section serves to provide a more thorough explanation of participatory methods for stakeholders, including why more traditional participatory communication methods may be appropriate in certain instances over more collaborative methods, as well as how to predict which methods are preferred by stakeholders through analyzing stakeholder levels of social and official trust. Additionally, facilitators should note the importance of managing conflict among stakeholders in collaboratives. The chapter ends with a summary of key methods to ensure success in utilizing this knowledge on participatory communication methods to foster collaboration and participation among stakeholders.

2.4.1. Participatory Methods for Stakeholders

In CWM, stakeholders participate in the process through collaborating with other stakeholders, including government representatives. Collaboration is different from other traditional methods of stakeholder participation, such as public hearings, because it "builds both community and individual capacity to: resolve conflict, lead, make decisions, and communicate with others" (Walker, 2004, p. 124). Collaborative efforts are reiterative processes that foster stakeholder participation through minimizing competition by analyzing commonalities and differences among stakeholders' values, focusing discussions on stakeholder interests and not their ideals, creating collaborative solutions through mutual learning among stakeholders, and allocating the responsibilities for implementing decisions among stakeholders (Walker, 2004, p. 124).

The table below illustrates non-deliberative (one-way information flows) and deliberative (two-way information flows and, therefore, collaborative) methods of participation for stakeholders:

Table 8. "Overview of Participatory Methods" for Stakeholders

Non-Deliberative	**Deliberative** *Random Selection of Participants*	**Deliberative** *Stakeholder ID & Selection*
• Surveys • Polls • Public comments • Public information • Public hearings	• Focus groups • Citizens' juries • Consensus conferences • Deliberative monetary valuation • Deliberative polling	• Advisory committees • Visioning workshops • Participatory modeling • Social multi-criteria evaluation • Mediation & negotiation

Table 8. "Overview of participatory methods" for stakeholders based on whether the communication is non-deliberative or deliberative and whether stakeholders are chosen randomly or specifically identified and selected. Adapted from *Science, Policy and Stakeholders in Water Management: An Integrated Approach to River Basin Management* by G. D. Gooch and P. Stålnacke (Eds.), 2010, Washington, DC: Earthscan, p. 39.

While CWM inherently encourages deliberative participatory methods, non-deliberative methods may be useful to stakeholders participating in CWM. Based on the desired goals, different methods may be more or less appropriate for a collaborative to utilize. The analytical framework explored in Section 2.3 highlights these different types of stakeholder participation methods and for which goals they are most appropriate. Overall, collaborative leaders can utilize a variety of methods to obtain maximum effectiveness, and the effectiveness of each depends upon how the method and various contextual and environmental factors interact (Rowe & Frewer, 2000, p. 25).

2.4.2. **A Framework for Predicting Preferred Participation Strategies**

Determining the right strategy for stakeholder participation is half the battle. In *Swimming Upstream: Collaborative Approaches to Watershed Management*, Sabatier et al. (2005) developed a framework that predicted stakeholders' preferences regarding strategies for participation. The basis of Sabatier et al.'s framework is the argument that "two judgments of trust influence the willingness of stakeholders to defer—or, alternatively, to be vigilant—in the policy process: social trust and official trust" (p. 88). Social trust can be defined as how much stakeholders trust each other while official trust can be defined as how much stakeholders trust policy officials (Sabatier et al., 2005, p. 88).

Sabatier et al. (2005) tested their framework by using surveys to interview stakeholders in the Illinois River watershed, where the biggest challenge to successful CWM was "the persistent inability of stakeholders to reach agreement about how to protect this shared resource" (p. 103). Sabatier et al.'s (2005, p. 113) framework accurately predicted preferred stakeholder participation strategies based on the stakeholders' levels of social and official trust 84% of the time:

Table 9. Accuracy of Sabatier et al.'s Framework for Predicting Preferred Stakeholder Participation Strategies

Predicted Stakeholder Role	Predicted Participation Strategy	Frequency that predicted strategy was preferred	Percentage Predicted Correctly
Deferential *(cooperative/subdued)*	Confirmation	5/8	62.5
Mixed *(cooperative/enhanced)*	Consultation	23/29	79.3

Mixed *(defensive/subdued)*	Facilitation	10/11	90.9
Vigilant *(defensive/enhanced)*	Negotiation	88/102	86.3
ALL		126/150	84.0

Table 9. Accuracy of Sabatier et al.'s framework for predicting preferred stakeholder participation strategies. Adapted from *Swimming Upstream: Collaborative Approaches to Watershed Management* (Google Books ed.) by P. A. Sabatier, W. Focht, M. Lubell, Z. Trachtenberg, A. Vedlitz, and M. Matlock (Eds.), 2005, Cambridge, MA: MIT P, p. 112.

The deferential role occurs when there is both social and official trust among stakeholders while a vigilant role played by stakeholders occurs when stakeholders distrust both policy officials and each other. The table below summarizes the roles stakeholders most likely play in the CWM process:

Table 10. Stakeholder Participation Roles Related to Level of Trust

Trust Dimension	Level of Trust	Participation Role	Implication
Social	Trust	*Cooperative*	Willing to cooperate
	Distrust	*Defensive*	Participate defensively to protect interests
Official	Trust	*Subdued*	Allow policy officials to lead process
	Distrust	*Enhanced*	Participate energetically in process

Table 10. Stakeholder participation roles related to level of trust and the implications of how those roles will impact stakeholder participation. Adapted from *Swimming Upstream: Collaborative Approaches to Watershed Management* (Google Books ed.) by P. A. Sabatier, W. Focht, M. Lubell, Z. Trachtenberg, A. Vedlitz, and M. Matlock (Eds.), 2005, Cambridge, MA: MIT P, p. 93.

While Chapter 3 deals specifically with the process of building levels of trust among stakeholders, it is necessary to understand the dynamics of trust as it affects what strategy is optimal to obtain successful stakeholder participation. Based on the levels of social and official trust, Table 11 below shows the appropriate participation strategy to use in order to encourage stakeholder participation. For example, when stakeholders have high amounts of both social and official distrust, negotiation is the preferred strategy as stakeholders want both to protect their interests from those of other stakeholders (a defensive role) and to ensure officials keep their word by participating actively in the collaborative process (an enhanced role). Negotiations are most appropriate in this case, as not only are all stakeholders treated equally amongst each other, but also officials are put on the same level as stakeholders in the deliberations, with third parties mediating and informing policy decisions made by the collaborative.

Table 11. Recommended Stakeholder Participation Strategies with Examples

Social Trust ***(preferred role)***	**Official Trust** ***(preferred role)***	**Strategy**	**Strategy Description**	**Example(s)**
Trust ***(cooperative)***	**Trust** ***(subdued)***	Confirmation	Policy officials formulate policy in conformance with their understanding of stakeholder preferences and then submit the policy proposal and its rationale to stakeholders to *confirm* stakeholder acceptance before adoption.	Public comments, polls, surveys, focus groups
Trust ***(cooperative)***	**Distrust** ***(enhanced)***	Consultation	Policy officials *consult* with stakeholders to identify their policy preferences before they formulate and adopt policy.	Public hearings, advisory committees
Distrust ***(defensive)***	**Trust** ***(subdued)***	Facilitation	Policy officials *facilitate* a policy dialogue among stakeholders to formulate a policy, which officials then adopt.	Citizen juries, consensus conferences
Distrust ***(defensive)***	**Distrust** ***(enhanced)***	Negotiation	Policy officials assist and participate in a stakeholder *negotiation*, which is facilitated by an independent mediator and informed by independent analysts, to formulate a policy, which officials then adopt.	Third-party mediated negotiations

Table 11. Recommended stakeholder participation strategies based on levels of trust, with strategy descriptions and examples. Adapted from *Swimming Upstream: Collaborative Approaches to Watershed Management* (Google Books ed.) by P. A. Sabatier, W. Focht, M. Lubell, Z. Trachtenberg, A. Vedlitz, and M. Matlock (Eds.), 2005, Cambridge, MA: MIT P, pp. 94-99.

The previous discussion of the literature on stakeholder participation (see Section 2.2) showed that negotiations and mediations are the types of stakeholder participation that provided the highest percent of high stakeholder contribution, which contribute to the production of high quality decisions in collaborative processes (Beierle, 2002, pp. 746-747). However, just because negotiation provides the highest level of collaboration from stakeholder contribution does not necessarily make it the most appropriate strategy to use when engaging stakeholders in CWM. Even in consideration of the roles of social trust and official trust, the predicted preferred stakeholder participation strategy might not be the only one used, depending on the goals the collaborative wishes to achieve (see Section 2.3). Instead, these recommended participation strategies provide a starting point for those involved in CWM to understand what strategy would work best based on their unique composition of stakeholders. It is important to note that just as no two watersheds are exactly alike, so no two CWM programs that utilize the same tools and strategies have the same stakeholders or have similar results.

2.4.3. **Managing Conflict among Stakeholders**

Conflict among stakeholders has a variety of sources and has a basis in a variety of things, including facts, values, beliefs, interests, jurisdiction, personal, history, or culture (Daniels & Walker, 2001, p. 30). Collaborative leaders can manage conflict from the start of the CWM process by first choosing the right participation strategy for stakeholders depending on levels of trust and distrust (see Section 2.4.2 above). Daniels and Walker (2001) provide a thorough analysis of the literature on environmental conflict in their book *Working through Environmental Conflict*; they state that conflict may be dealt with "directly through collaboration or competition, yield to, or accommodate, the other party, or avoid the dispute" (p. 58). Daniels and Walker (2001, p. 63) go on to highlight that the key benefit of a collaborative approach to conflict resolution rather than a competitive one (e.g. litigation or unilateral decision-making): collaborative decision-making by stakeholders reduces competition through a reiterative process that explores the various values and ideologies of stakeholders through a joint fact-finding process in order to provide cooperative solutions to issues in a way that increases social capital and disseminates actions among all parties.

However, collaboration is not always acceptable as a tool for handling environmental conflicts. Cox (2010, pp. 140-141) points out seven situations in which collaboration might not be advisable:

- Collaboratives that have a stakeholder group that is not representative of general public stakeholders.
- National standards for environmental policies could be compromised if local-level collaboratives are given too much leeway, creating a pathway for many exemptions from the rule.
- Unequal access to information, resources, and training could lead to an assimilation of interests, particularly when dealing with industry and government representatives.
- In some cases, groups may feel that reaching any consensus, even if it is the "lowest common denominator," is a successful collaboration; this essentially only defers the decision-making to a later, more critical point in time.

- Effective long-term solutions might be sacrificed in order to reduce conflict and reach an agreement.
- Collaboratives do not necessarily have the power to implement any decisions upon which they can agree.
- Inherent conflict ("deep-rooted value differences, very high stakes, or irreducible, win-lose confrontations") may prevent any decision from being made by the collaborative.

For example, a CWM program involving tribal lands or multiple countries could have significant difficulty in legally enforcing fishing quotas. Such a situation could also exacerbate problems for stakeholders in accessing information, particularly in the instance of language barriers. Additionally, cultural differences in resource-use values could become an insurmountable barrier to successful CWM if one group of stakeholders is committed to upholding their values at the expense of the successful implementation of CWM program policies.

Furthermore, Wondolleck and Yaffee (2000) cite fundamental value differences as the primary reason why collaborative efforts would not work; in their opinion, "where groups can do better pursuing their interests in other decision-making realms, they should do so" (p. 48), such as when an organization wants to establish a legal precedent, or when weaker parties wish the problem to worsen in order to raise general awareness and shift the balance of power. In particular, these other decision-making realms can include courtrooms, protests, or media advertisements, publications or interviews. Therefore, when creating a CWM program and identifying stakeholders, the appropriateness of collaboration to the problem at hand, in addition to the collaborative potential of stakeholders working together needs to be assessed in order to guarantee that the necessary steps are taken to ensure the effectiveness of the CWM program.

2.4.4. **Methods to Ensure Success in Stakeholder Participation**

Chess and Purcell (1999) outline five rules of thumb for participatory efforts:

- "Clarify goals.
- Begin participation early and invest in advance planning.
- Modify traditional participatory forums to meet process or outcome goals.
- Implement a public participation program with various forms of public participation.

- Collect feedback on participation efforts" (p. 2691).

By ensuring that the members of the collaborative understand what each other means by "success", the effectiveness of stakeholder participation can be measured, monitored, and altered in order to ensure that current stakeholder participatory methods are effective and successful in achieving the collaborative's goals (see also the discussion of appropriate participatory methods for stakeholders based on the collaborative's goals in Section 2.3).

A monitoring and evaluation process for this success must be utilized from the onset of the process of stakeholder participation in order to be able to measure its effectiveness (Buchy & Hoverman, 2000, p. 22). Buchy and Hoverman (2000) state, "issues of power, representation, and (social) change have to be either addressed or at least anticipated by the processes put in place" (p. 23). They define the key attributes that define successful public participation as outlined in the table below:

Table 12. Key Attributes of Effective Public Consultation

Principles	Attributes
Commitment and clarity	Disclosure of interests Agreed objectives and expectations Transparency of the process
Time and group dynamics	Time, timing Continuity and follow-up
Representativity	Representativity Equity
Transfer of Skills	Resourcing the process Quality of information

Table 12. Key attributes of effective public consultation categorized by overarching principle. Reprinted from "Understanding Public Participation in Forest Planning: A Review" by M. Buchy and S. Hoverman, 2000, *Forest Policy and Economics, 1*(1), p. 23.

In examining these attributes, it is important to point out that success can either be measured by the outcomes of the participation (therefore, stakeholder participation is successful only if the desired outcomes are achieved) or by the means of the participation (including fairness, procedures, exchange of information, and the process itself) . Furthermore, in regards to stakeholder participation, "the history of the issue, the context in which the participation takes place, the expertise of those planning the effort, and the agency commitment may all have an impact on a particular program's success or failure" (Chess & Purcell, 1999, p. 2690). Depending on the goals of stakeholder participation in CWM (see Table 7) and the level of trust among stakeholders (see 0), different communication strategies may be most appropriate, even if those

appropriate strategies are not completely collaborative in nature. An expanded discussion of how to measure successes in stakeholder participation is provided in Section 0.

2.5 Strategy for Environmental Communication

As previously mentioned, successful stakeholder participation in collaborative efforts requires effective communication, even if the communication methods used are not necessarily collaborative. It is important to utilize an effective communication strategy in order to achieve such success. As first described in the introduction, this research has adapted the OECD's (1999) "10 Steps towards an Effective Communication Strategy" for stakeholder participation, with the goal of achieving a comprehensive communication strategy that serves as "an integral part of a larger project or program" (OECD, 1999, p. 13). Figure 13 below shows an overview of the communication strategy framework and highlights its reiterative nature. It has been adapted for collaborative communications and includes three stages (reduced from OECD's original four (see Table 4 above)): assessment, planning, and action and reflection. It also adapts the OECD's ten steps within the three stages for both one-way (traditional) and two-way (collaborative) communication methods used in collaborative efforts:

Figure 13. Overview of the Communication Strategy Framework

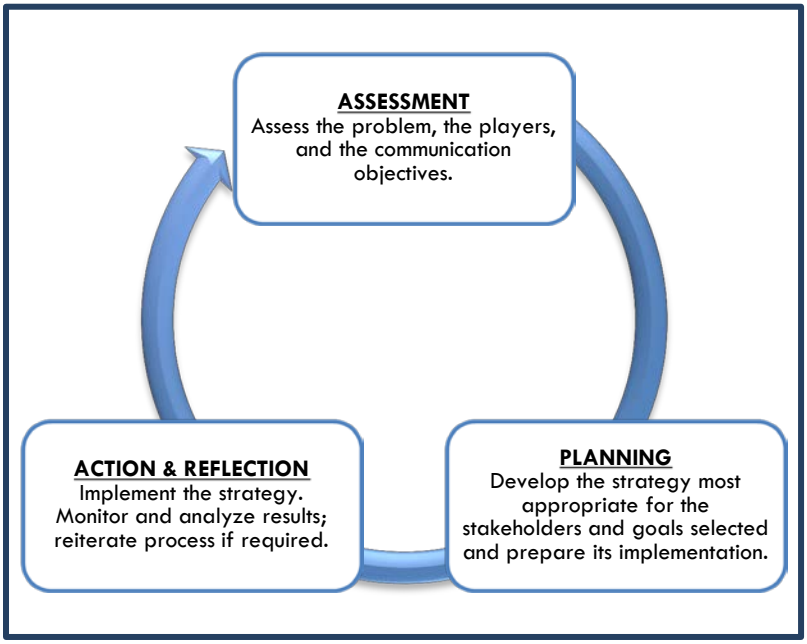

Figure 13. The three stages of the EC strategy, as developed by the OECD and adapted for collaborative two-way communications. Adapted from *Environmental Communication: Applying Communication Tools*

Towards Sustainable Development (Working Paper of the Working Party on Development Cooperation and Environment) by the OECD, 1999, Paris: OECD, p. 13.

This strategy fits into the framework highlighted in Table 12 above as it can be utilized to communicate the commitment and clarity of the collaborative, incorporate time and group dynamics into its process, provide stakeholders with communication methods to ensure representativity, and achieve transfer of skills by providing quality information and resources to the process of collaboration among participants in the CWM program.

While the example strategies highlighted by the OECD in their presentation of this framework centered on utilization of one-way communication strategies, this adaptation utilizes both uni- and bi-directional communication strategies, which have varying degrees of collaboration, based on the stage of the process and the desired outcomes (see the matrix on stakeholder participation goals and associated communication mechanisms in Table 7). This adaptation also builds on the literary research from earlier in the chapter and references prior sections as appropriate. Furthermore, please note communication as discussed here refers specifically to environmental communication, which includes stakeholder participation (please refer back to Section 1.4 for a more thorough discussion of environmental communication and its role in collaborative efforts).

Table 13. Strategy for Effective Communication in Stakeholder Participation

ASSESSMENT	
1	**Situation Analysis and Problem Identification**
	In this first step, collaborative managers identify the situation and analyze key aspects of the problem the collaborative is trying to address in terms of how to ensure the CWM process develops and maintains effective stakeholder participation strategies going forward.
2	**Actors and Knowledge, Attitude, Practices (KAP) Analyses**
	Strategy developers identify, categorize, and assess stakeholders on their knowledge, levels of social and official trust, attitudes toward collaboration and other stakeholders, and practices in regards to the problem addressed by the CWM process. Founders of the collaborative can gather this information through public surveys, research, or other appropriate methods (see Figure 7 and associated text on stakeholder identification and analysis in Section 2.2 for a more in-depth discussion on the topic).
3	**Communication Objectives**
	According to the OECD (1999), "communication objectives should be very specific and aimed at increasing knowledge, influencing attitudes, and changing practices of intended beneficiaries [stakeholders] with regards to a particular action" (p. 24). Therefore, taking into account the information gathered in Step 1 and 2, the framework identified in the case study of Section 2.3 (in particular, see Table 7) should be used to determine which of the six communication goals for stakeholder participation are priorities for the CWM process to be most successful.
PLANNING	
4	**Communication Strategy Development**

	While this entire strategy is the framework for ensuring effective communication in stakeholder participation, the CWM leaders need to determine who is responsible for communicating where the resources come from to conduct this communication and the indicators to use to measure the effectiveness of the communication as it relates to effective stakeholder participation. Based on the objectives identified in Step 3 above, one or more communication strategies may be more appropriate to achieve the goals of the collaborative (please refer back to Table 7). The strategies chosen are also be dependent upon the amount of trust among stakeholders (see Section 2.4.2) as well as the level of conflict and how it is managed (see Section 2.4.3).
5	**Participation of Strategic Groups**
	See Section 2.4.2 for the framework to determine what collaboration strategy is appropriate to encourage stakeholder participation based on each stakeholder groups' levels of social and official trust.
6	**Selection of Communication Method(s) based on Recommended Participatory Strategy**
	Based on the participatory strategy recommended, the best method(s) for communication (including, but not limited to, emails, surveys, public hearings, citizen juries/panels, or mediated negotiations) should be selected.
7	**Organizing the Details of the Communication Method**
	In order to encourage the participation of different stakeholder groups, messages "should fit the media selected" (Step 6) and "must be designed to suit the specific characteristics, educational and intellectual horizon and the aspirations" for the stakeholder groups involved in the CWM process (OECD, 1999, p. 32). Furthermore, when the communication involved is more collaborative in nature (e.g. a public hearing or mediated negotiation), the details of how this communication will occur, including what key points must be discussed and which stakeholders will be involved, must be hammered out in this stage.
8	**Final Preparation for the Selected Communication Method**
	If possible, a sample from the target stakeholder group is used to assess if the communication method chosen communicates the necessary information in order to achieve the goals of stakeholder participation. In the case of dialogues among stakeholders and collaborative leaders (e.g. public hearings or mediated negotiations), this step would ensure ample advertisement for the event(s) and provide training (if necessary) to any participants regarding the communication process and/or to address any knowledge gaps prior to the main communication event.
ACTION & REFLECTION	
9	**Field Implementation**
	The communication method is implemented. Those in charge of implementation must ensure that the communication method has an appropriate timetable for presenting the message and, if part of the strategy, receiving the input requested. During this period, it would be wise to have "a good management information system that provides organizers with rapid feedback on important strategy activities and thus helps to readjust or change the strategy if necessary" (OECD, 1999, p. 35).
10	**Process Documentation and Monitoring and Evaluation (M&E)**
	Use the methods detailed in Sections 2.5 and 2.6 to measure whether or not the communication methods produced effective stakeholder participation. Any significant findings at this step, as with any other of the steps, could cause a reiteration of parts or the entire process in order to increase success in achieving effective stakeholder participation.

Table 13. OECD's EC strategy as applied, adapted, and expanded by the author for collaborative communications in stakeholder participation. Adapted from *Environmental Communication: Applying Communication Tools Towards Sustainable Development* (Working Paper of the Working Party on Development Cooperation and Environment) by the OECD, 1999, Paris: OECD, pp. 13-36.

2.6 **Measuring Successes**

In order to be able to measure success of stakeholder participation accurately, "success" must be defined and related to the purpose of the participation. As previously discussed in the end of Section 2.2, there is a positive correlation between the amount (more participation is better) and type (collaborative participation strategies are better) of stakeholder participation and the level of quality decision-making in CWM. Based on the collaborative's goals of stakeholder participation (see Section 2.3 for a complete discussion, as well as Step 3 in Table 13), different indicators should be utilized to objectively measure how successful the collaborative's efforts were in achieving those goals.

An indicator is something that indicates the state of things in order to show how well a system is working; it should be relevant, understandable, reliable, and provide information in a timely manner (Hart, 1999, pp. 26-28). Adapted for CWM purposes, indicators can inform how well the collaborative is working as a process itself, in addition to how effective it is in achieving desired environmental outcomes; however, "rather than developing indicators of environmental outcomes, they [collaboratives] usually focus on outputs (such as plans, projects, management practices, and policies) because outputs are more easily measured" (Koontz & Thomas, 2006, p. 114). Koontz and Thomas (2006, p. 114) point out that other challenges to measuring environmental outcomes include the time gap between the actions of CWM and the need to measure environmental indicators before and for a long time after a collaborative takes action; additionally, it is very difficult to isolate singular variables that affect environmental change, especially since CWM activities only indirectly cause improvements in environmental quality.

In their analysis of several CWM initiatives in Ohio, Koontz and Johnson (2004) purport that the composition of stakeholder groups can inform what broad categories of indicators are most effective in measuring perceived accomplishments of the CWM effort:

> Groups with a broader array of participants tend to excel in watershed plan creation, identifying/prioritizing issues, and group development and maintenance. In addition, groups comprised of a relatively balanced mix of governmental and non-governmental participants are more likely to list planning/research and group development and maintenance results than are groups comprised primarily of non-governmental participants. In contrast, groups with a narrower

> membership and groups that are composed primarily of non-governmental participants may focus more on pressuring government for policy change. (p. 185)

While each situation of stakeholder participation is unique, the Carnes et al.'s (1998) case study of measuring the success of stakeholder participation in DOE activities is useful in illustrating the general framework that should be used to come up with proper indicators to measure the success of stakeholder participation in regards to both its environmental outcomes and the process of participation itself. The authors came up with sixteen attributes of success and categorized them in five broad categories; the middle column is an adaptation from the literature to indicate whether the broad categorical area contains attributes of CWM environmental outcomes or the procedural ones.

Table 14. Attributes of Success for Stakeholder Participation in DOE Activities

Broad Categorical Area of Attributes	Associated Outcomes	Attributes for Success
I. The decision-making process	Procedural	• The decision-making process allows full and active stakeholder representation • DOE is presented with comprehensive and thoughtful input by the public • The decision-making process is accepted as legitimate by stakeholders
II. Effects of public participation on stakeholder understanding and attitudes	Procedural	• The public understands DOE's environmental management problems and associated actions • The public understands the connection between clean-up costs and environmental benefits • DOE understands public concerns • The public has trust and confidence in DOE and the DOE facility
III. Effects of public participation on environmental management decisions	Procedural	• Key decisions are influenced by the public • Key decisions are improved by public participation • Key decisions are accepted as legitimate by stakeholders
IV. Effects of environmental management decisions on site conditions	Environmental	• Environmental management costs are minimized • Adverse environmental impacts are minimized • Adverse impacts are distributed equitably among the public
V. Effects of environmental management decisions on stakeholders' objectives	Procedural	• Stakeholders (DOE and non-DOE) objectives for a particular public participation effort are met • DOE's site-specific mission is accomplished • The overall objectives of non-DOE stakeholders are met

Table 14. Categorized attributes of success for stakeholder participation in DOE activities and whether the associated outcomes of these attributes are procedural or environmental in nature. Adapted from "Measuring the Success of Public Participation on Environmental Restoration and Waste Management Activities in the U.S. Department of Energy," by S. A. Carnes, M. Schweitzer, E. B. Peelle, A. K. Wolfe, and J. F. Munro, 1998, *Technology in Society, 20*(4), p. 390.

Carnes et al. (1998) surveyed key stakeholder groups from the operations of nine DOE facilities, which exhibited variety not only in their geographical locations, but also in the types of environmental management activities conducted, in order to find out which of the sixteen attributes from Table 14 were statistically important to stakeholders. These diverse stakeholder groups included "DOE project managers and public participation specialists, contractor project managers and public participation specialists, representatives of tribal, state, and local governments, federal and state regulatory authorities, environmental interest groups, and other interested parties" (Carnes, Schweitzer, Peelle, Wolfe, & Munro, 1998, p. 385).

The three most important attributes identified were "the decision-making process is accepted as legitimate by stakeholders, the DOE understands public concerns, and the decision-making process allows full and active stakeholder representation;" furthermore, many respondents also found the following three attributes important: "the public has trust and confidence in DOE and the DOE facility, key decisions are accepted as legitimate by stakeholders, and key decisions are improved by public participation" (Carnes, Schweitzer, Peelle, Wolfe, & Munro, 1998, p. 392). In addition to these key attributes, a seventh attribute should also be considered as important in measuring the success of stakeholder participation, which is that the "site-specific mission is accomplished" (Carnes, Schweitzer, Peelle, Wolfe, & Munro, 1998, p. 395).

As mentioned before, measuring the success of these attributes requires monitoring and assessment of indicators. Carnes et al. (1998, p. 404) developed the indicators to measure the seven key attributes identified by consulting with the broad array of key stakeholder groups at the nine DOE facilities; they analyzed the results and distilled the hundreds of the responses:

Table 15. Selected Attributes of Success in Stakeholder Participation in DOE Activities and Associated Performance Indicators

Selected Attribute	Performance Indicator	Type of Indicator
The decision-making process allows full and active stakeholder representation	The proportion of all identifiable stakeholder groups that have taken part in public participation efforts; and	Behavioral
	The mechanisms used to attract, engage, and maintain the interest of stakeholders throughout the public participation effort	Behavioral

The decision-making process is accepted as legitimate by stakeholders	Participants' evaluation of the legitimacy of decision-making processes at various stages in the decisions cycle for the EM [Office of Environmental Management] activity in question	Perceptual
DOE and other stakeholders understand each other's' concerns	Internal and external stakeholders' ability to identify each other's concerns and understand the bases of those concerns	Behavioral
The public has trust and confidence in DOE and the DOE facility	The public's self-reported levels of trust and confidence in DOE and its contractors	Perceptual
Key decisions are improved by public participation	Judgments by internal and external stakeholders that public participation has led to better decisions	Perceptual
Key decisions are accepted as legitimate by stakeholders	Participants' evaluation of the legitimacy of decisions for a given EM activity	Perceptual
DOE's site-specific mission is accomplished	The development and implementation of a decision integrating cost, schedule, environmental, safety, and health factors plus other external stakeholder concerns	Behavioral

Table 15. Selected attributes of success in stakeholder participation in DOE activities and associated performance indicators. Reprinted from "Measuring the Success of Public Participation on Environmental Restoration and Waste Management Activities in the U.S. Department of Energy," by S. A. Carnes, M. Schweitzer, E. B. Peelle, A. K. Wolfe, and J. F. Munro, 1998, *Technology in Society*, *20*(4), p. 403.

Using this framework as a guide, indicators that can measure successes in stakeholder participation for CWM initiatives are as follows:

Table 16. Attributes of Success in Stakeholder Participation for CWM and Associated Performance Indicators

Selected Attribute	Performance Indicator	Type of Indicator
The decision-making process allows full and active stakeholder representation	The proportion of all identifiable stakeholder groups that have taken part in stakeholder participation efforts; and	Behavioral
	The mechanisms used to attract, engage, and maintain the interest of stakeholders throughout the stakeholder participation effort	Behavioral
The decision-making process is accepted as legitimate by stakeholders	Participants' evaluation of the legitimacy of decision-making processes at various stages in the decisions cycle	Perceptual
Stakeholders understand each other's concerns	Internal and external stakeholders' ability to identify each other's concerns and understand the bases of those concerns	Behavioral
Stakeholders have both official and social trust (see Section 2.4.2)	The stakeholder's self-reported levels of trust and confidence in CWM officials and each other	Perceptual
Key decisions are improved by stakeholder participation	Judgments by internal and external stakeholders that stakeholder participation has led to better decisions	Perceptual
Key decisions are accepted as legitimate by stakeholders	Participants' evaluation of the legitimacy of decisions for CWM activities	Perceptual

The CWM mission is accomplished	The development and implementation of a decision integrating cost, schedule, environmental, safety, and health factors plus other external stakeholder concerns	Behavioral

Table 16. Attributes of success in stakeholder participation for CWM and associated performance indicators. Adapted from "Measuring the Success of Public Participation on Environmental Restoration and Waste Management Activities in the U.S. Department of Energy," by S. A. Carnes, M. Schweitzer, E. B. Peelle, A. K. Wolfe, and J. F. Munro, 1998, *Technology in Society*, *20*(4), p. 403.

The best communication strategies to obtain the information required to measure these performance indicators should be used (see Section 2.5), while keeping in mind the goals of the communication in order to pick the most effective strategies (see Sections 2.3 and 2.4.2) and avoiding conflict in the measurement activities (see Section 2.4.3). For example, to measure stakeholders understanding of each other's concerns, surveys might be the most effective communication strategy when there are high levels of conflict among stakeholders, but citizen juries or advisory committees might be the better choice if stakeholders have lower levels of conflict coupled with high trust of collaborative officials. Overall, Carnes et al. (1998, p. 404) caution that the leaders should measure and consider the entire group of key attributes and associated indicators, as measuring only a subsection may not fully represent the complexity and multi-faceted nature of the CWM process and its stakeholders.

2.7 Application to CBSD

Since both CWM and CBSD are collaborative efforts, the theories behind stakeholder participation that apply to CWM also can apply to CBSD in a broader sense. In this case, changes in sustainable community indicators (see Table 16, which provides indicators for CWM that can also apply to CBSD) could be used to measure stakeholder participation and its effectiveness. Effective sustainable community indicators "address the community capital's carrying capacity, show the link among the society, economy, and environment, have a long-term focus, increase local sustainability, are based on timely, reliable data, and the community finds the indicators understandable, useable, and relevant" (Hart, 1999, p. 29).

3. Building Trust among Stakeholders

3.1 Preface

Chapter 3 focuses on deriving BMPs of building trust among stakeholders in CWM and then analyzes the applicability of these BMPs to CBSD. *Section 3.2* provides an expanded analysis of the subject area examined previously in the literature reviewed in Chapter 1 by defining trust in reference to stakeholder participation and its associated role in CWM. Next, *Section 3.3* examines a case study in building trust among stakeholders.

In the second half of the chapter, I review the literature to extrapolate BMPs for stakeholder participation in CWM in the following areas:

- The tools and methods for effective collaboration *Section 3.4*
- The nature of effective communication strategies *Section 3.5*
- How to measure success in each area *Section 3.6*
- How to apply the principles to CBSD *Section 0*

3.2 Trust among Stakeholders and Its Role in CWM

Building on the idea that community mobilization involves different types of community capital (see Figure 3), Putnam's (1993) pivotal work specifically defines trust as an integral part of a subsection of community capital: social capital. Sabatier et al. (2005) expand upon this concept, stating that trust is "the product of the interaction between the perceived stake that is at risk should trust be betrayed […] and the perceived likelihood that the trustee will fail to act to protect the stakeholders' stake" (p. 90).

While the importance trust plays in informing stakeholder participation has been discussed previously by this research (see Section 2.4.2), it has an even larger role to play in natural resource management as "public distrust, especially local community distrust, can have severe implications for the quality and durability of natural resource policy decisions" (Leahy & Anderson, 2008, p. 100). In their analysis of stakeholder interviews in the Kaskaskia River Watershed, managed by the U.S. Army Corps of Engineers (Corps), Leahy and Anderson (2008) identified five factors of trust that affected the stakeholders' trust in the collaborative: "trust in the federal government, social trust of people in general, trust in the technical competence of Corps personnel, trust in the shared interests between the individual, community, the Corps, and its personnel, and trust as a result of procedural justice beliefs" (p. 103). Leahy

and Anderson (2008, p. 105) made the important observation that the importance of different trust factors and the levels of trust varied as stakeholders became more involved in the CWM process, gaining knowledge and experience with the Corps who were managing the watershed.

It is possible that addressing uncertainties in stakeholder knowledge (described in Section 2.2) gain serve a fundamental role in building trust among stakeholders. For example, Wondolleck and Yaffee (2000) explain that "many collaborative efforts expand understanding by generating new information and dealing with uncertainty through joint research and fact-finding" (p. 29). In fact, these activities not only address uncertainties but also build social capital through strengthening personal relationships among stakeholders; for example, "the Eel River [Eel River Delta Sustainable Agriculture Committee] effort's joint fact-finding trips help build trust among participants" (Wondolleck & Yaffee, 2000, p. 29).

Additionally, addressing stakeholders' confidence in the science involved in the CWM process (see Figure 8:

Interactions between Scientists and Non-Scientists in CWM) is also a matter of trust. Pintér et al. (2012) make this conclusion, stating that "there are several factors that contribute to building trust, but one of the most critical is presenting information objectively without any apparent bias" (p. 24). Cash et al. (2002), in their analysis of a variety of CWM programs in the United States, along with other natural resource management projects, provide a suggested framework for dealing with the "salience, credibility, and legitimacy of information produced and transmitted across boundaries" (p. 15), where boundaries can include those between scientists and non-scientists:

Table 17. Organizational Structures and Strategies to Increase Salience, Credibility, and Legitimacy of Information Provided across Stakeholder Boundaries

Strategy/Structure	Selected Description
1) Accountability	"When the actors in a boundary organization are dually accountable, they must take into account the interests, concerns and perspectives on both sides of the boundary" (pp. 15-16)
2) Use of Boundary "Objects"	Boundary "objects" include "hydrologic, fisheries, or climate models, forecasts, and assessment reports. They are 'objects' over which disparate perspectives can argue and agree, and they can serve as a focal point for common understanding" (p. 16).
3) Participation Across the Boundary	"Effectiveness is associated with systems that engage multiple actors across multiple boundaries. Cases that did not do this […] have special difficulty producing salient information or technology, but also experience difficulties producing legitimate and credible information for critical actors" (p. 16).
4) Mediation and a Selectively Permeable Boundary	"Mediation reduces the potential tradeoffs and conflicts between increasing salience, credibility, or legitimacy" and "the mediator acts to make the boundary selectively porous, allowing bridging the boundary for some purposes (e.g., getting user research needs to researchers), but keeping the boundary solid for others (e.g., keeping the scientific process out of politics)" (p. 17).
5) Translation	"Some of the most central challenges when crossing boundaries are about differences in jargon, language, and interpretation on opposite sides of a boundary" (p. 17).

Table 17. Organizational structures and strategies to increase salience, credibility, and legitimacy of information provided across stakeholder boundaries, with selected descriptions. Adapted from *Salience, Credibility, Legitimacy and Boundaries: Linking Research, Assessment and Decision Making* by D. Cash, W. C. Clark, F. Alcock, N. M. Dickson, N. Eckley, and J. Jäger, 2002, Cambridge, MA: KSG Working Papers Series, pp. 15-17.

Thus, utilizing these elements in a CWM program could help to increase stakeholder trust in the provision of unbiased scientific information in the CWM process. Coupled with the strategies discussed in this chapter, CWM initiatives can increase social capital by building the social and official trust of stakeholders involved in the collaborative. However, it must be kept in mind that building trust does not

happen immediately; rather, “trust emerges slowly in situations where people treat each other with respect and are patient and willing to understand” (Wondolleck & Yaffee, 2000, p. 164).

3.3 Case Study in Building Trust: The Long Tom Watershed Council

In order to examine how to build social and official trust among stakeholders, this section explores a specific case study that built and strengthened the infrastructure of social capital (see Section 3.2) among stakeholders in the watershed through increasing stakeholder confidence in scientific information provided by the collaborative. Flitcroft et al. (2009) conducted a case study examination of the Long Tom Watershed Council (LTWC) in Oregon, responsible for the management of ten subwatersheds, where the social capital infrastructure was developed “through a deliberate, transparent, and evolving process that has steadily built and strengthened trust between the Council and the public” (p. 6). The three core methods taken by the LTWC to increase social capital infrastructure are:

- “The social [capital] infrastructure is founded upon science as iterative and integrative; scientists working alongside landowners as equal local citizens with different and useful talents;”
- “Data collection that informs scientific interpretation has become a medium for outreach and education, and the data are collected at a scale designed to answer community-generated questions;” and
- “The subwatershed enhancement program integrates and interprets scientific results for subwatershed residents in an open question-and-answer format with skepticism allowed and components of professional judgment clearly acknowledged, thereby building trust” (Flitcroft, Dedrick, Smith, Thieman, & Bolte, 2009, p. 7).

All three methods highlight the involvement of stakeholders and facilitators in various parts of the CWM process, which increases transparency, as well as stakeholder confidence in the information presented to them by facilitators. While the first method highlights the importance of the integration of scientific and local knowledge, the second method emphasizes the importance of selecting proper indicators and collecting the associated data in order to measure success and answer questions important to stakeholders. Most importantly, the third method highlights the importance of communication among stakeholders and

facilitators in building their trust in the scientific information provided, as well as in each other. Overall, the LTWC shows that transparency and involvement of stakeholders in the LTWC, coupled with effective communication about scientific information, helps foster stakeholder trust in the information provided and ultimately with each other, and thus fosters the creation of social capital infrastructure.

The benefits of fostering social capital infrastructure, and thus both social and official trust, can be seen in the illustration below:

Figure 14. Evolution of Social Infrastructure Growth and Associated Results in CWM

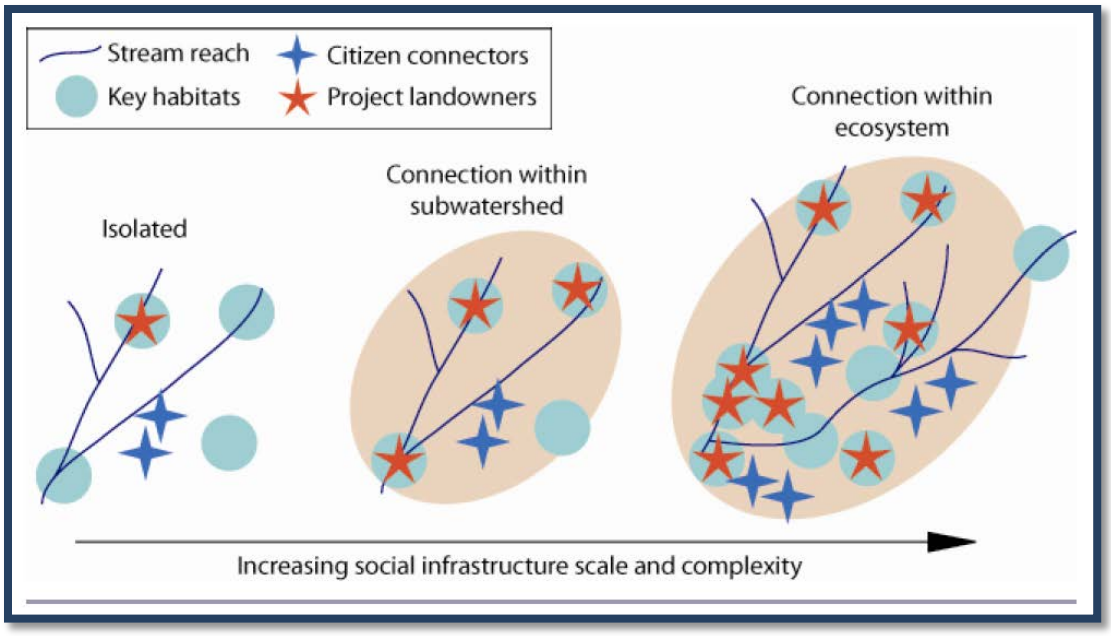

Figure 14. Evolution of social infrastructure growth and associated results in CWM. Reprinted from "Social Infrastructure to Integrate Science and Practice: the Experience of the Long Tom Watershed Council" by R. L. Flitcroft, D. C. Dedrick, C. L. Smith, C. A. Thieman, and J. P. Bolte, 2006, *Ecology & Society*, *14*(2), p. 11.

As relationships among landowners and the LTWC develop through the growth of social capital infrastructure, the focus of projects moves from isolated project locations, to concerted efforts among multiple landowners within the same subwatershed, to large-scale projects that address issues at the scale of the ecosystems. Fostering the growth of social infrastructure through trust-building efforts necessarily leads to increased collaboration as a whole because "as the social infrastructure grows, watershed residents become citizen connectors facilitating learning and projects among their neighbors, and the number of individual landowners willing to be involved in the restoration of ecologically important habitat increases" (Flitcroft, Dedrick, Smith, Thieman, & Bolte, 2009, p. 11).

3.4 Tools and Methods for Effective Collaboration

While the LTWC provides an excellent starting point for methods to build trust among stakeholders through increased confidence in scientific information, facilitators need more generalized tools and methods to analyze what dimensions of trust are most important to building stakeholder trust. No two watersheds are alike; therefore, while building stakeholder confidence in scientific information was

crucial for the success of the LTWC, another CWM program may need to emphasize building other dimensions of trust, based on the composition of their stakeholders. However, conducting a thorough analysis on dimensions of trust important to a specific watershed does not need to start from scratch; instead, facilitators can utilize the groundwork of Pirson and Malhotra (2011).

In their analysis of survey data from almost 1,300 stakeholders from various stakeholder groups in four different organizations, Pirson and Malhotra (2011, p. 1087) developed a framework that identifies the dimensions of trust that most affect levels of stakeholder trust in the organization. The two dimensions forming the contextual basis of the framework are on *depth* (the intensity of their interactions with an organization: shallow/deep) and *locus* (their position in regards to the organization: internal/external) (Pirson & Malhotra, 2011, p. 1091). Table 18 highlights the dimensions of trust analyzed:

Table 18. Dimensions of Trust and Associated Organizational Attributes

Dimension of Trust	Associated Trust Attributes
Managerial Competence	• Can successfully adapt to changing demands • Is able to reach set goals
Technical Competence	• Is very competent in its area • Generally has high standards
Integrity	• Does not try to deceive • Has high moral standards • Treats its stakeholders with respect
Benevolence	• Is caring • Listens to stakeholders' needs • Does not abuse stakeholders
Identification	• Stakeholders can identify with organization • Personal values of stakeholders match the values of the organization • Stakeholders feel connected with the organization
Transparency	• Explains its decisions • Says if something is wrong • Is transparent • Openly shares all relevant information

Table 18. Dimensions of trust and associated organizational attributes. Adapted from "Foundations of Organizational Trust: What Matters to Different Stakeholders?" by M. Pirson and D. Malhotra, 2011, *Organization Science*, *22*(4), p. 1100.

Pirson and Malhotra (2011) found that "relevant dimensions of trustworthiness vary systematically across different stakeholder types and provide strong support for the validity of the depth and locus dimensions" (p. 1087). Figure 15 illustrates their findings:

Figure 15. "Relevance of Trustworthiness Dimensions across Stakeholder Types"

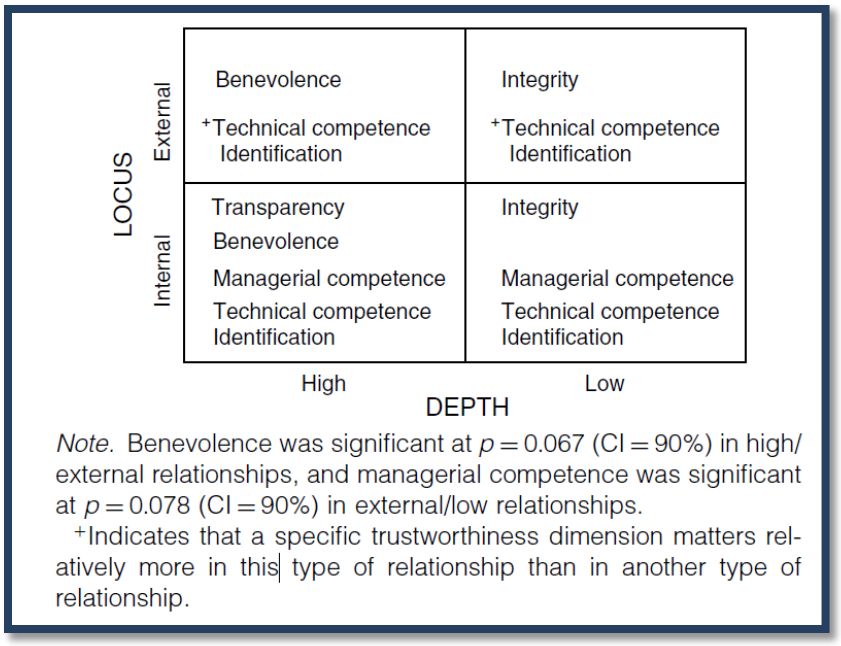

Figure 15. "Relevance of trustworthiness dimensions across stakeholder types." Reprinted from "Foundations of Organizational Trust: What Matters to Different Stakeholders?" by M. Pirson and D. Malhotra, 2011, *Organization Science*, *22*(4), p. 1099.

In their analysis, Pirson and Malhotra (2011) found that "stakeholders who had shallow relationships with the organization based their trust in the organization largely on perceptions of integrity, whereas trust among deep stakeholders was based on perceptions of benevolence" (p. 1099). Furthermore, they state that the results "support the broad relevance of (at least some aspect of) ability. We do not find support for the general relevance of integrity or benevolence; rather, identification emerges as an independent, fundamental component of organizational trust" (p. 1099). Interestingly, Pirson and Malhotra found that "there was little evidence for the relevance of transparency in shallow relationships" even though "transparency may be most needed by those who lack first-hand information" (p. 1099). In fact, the researchers hypothesize that transparency "may be most valued by those who have the most at stake in their relationships with the organization (i.e., those in deep, internal relationships)" (Pirson & Malhotra, 2011, p. 1099).

This strategy can be coupled with the Sabatier et al.'s (2005) framework in predicting stakeholder participation strategies based on levels of trust (refer back to Section 2.4.2) in order to identify the current levels of stakeholder social and official trust, identify the related factors affecting the trust, implement

strategies (e.g. increasing stakeholder knowledge) to increase this trust, and reanalyze the levels of trust using the original methodology. This process would thus serve to foster collaboration in CWM.

3.5 Strategy for Environmental Communication

Building trust among stakeholders requires certain measures in stakeholder communication. Generally, the strategy adapted and detailed in Section 2.5 provides an effective framework for developing an effective communication strategy to build trust among stakeholders as it stands. However, there are certain considerations to make in addition to those for effective communication for stakeholder participation. Table 19 replicates the strategy of Table 13, with additional notations in blue bolded text to allow for the special needs of effective stakeholder communication in building trust among stakeholders.

Table 19. Strategy for Environmental Communication for Building Trust among Stakeholders

ASSESSMENT	
1	**Situation Analysis and Problem Identification**
	In this first step, collaborative managers identify the situation and analyze key aspects of the problem the collaborative is trying to address in terms of how to ensure the CWM process develops and maintains effective stakeholder participation strategies going forward. **In building an effective communication strategy to foster trust among stakeholders, it is important to focus on how current levels of trust influence stakeholder participation and if trust-building communications are necessary.**
2	**Actors and Knowledge, Attitude, Practices (KAP) Analyses**
	Strategy developers identify, categorize, and assess stakeholders on their knowledge, levels of social and official trust, attitudes toward collaboration and other stakeholders, and practices in regards to the problem addressed by the CWM process. Founders of the collaborative can gather this information through public surveys, research, or other appropriate methods (see Figure 7 and associated text on stakeholder identification and analysis in Section 2.2 for a more in-depth discussion on the topic). **While all of these aspects help influence and shape the levels of trust among stakeholders, special considerations should be given to determining where stakeholder groups have gaps in trust. Depending on the level of conflict among stakeholders already present, this might be done best through traditional one-way methods (e.g. surveys) rather than a group discussion with all stakeholders (see Section 2.4). This way, the communication strategy developed can target key gap areas in stakeholder social and official trust with the solitary aim of building stakeholders' levels of social and official trust.**
3	**Communication Objectives**
	According to the OECD (1999), "communication objectives should be very specific and aimed at increasing knowledge, influencing attitudes, and changing practices of intended beneficiaries [stakeholders] with regards to a particular action" (p. 24). Therefore, taking into account the information gathered in Step 1 and 2, the framework identified in the case study of Section 2.3 (in particular, see Table 7) should be used to determine which of the six communication goals for stakeholder participation are priorities for the CWM process to be most successful. **In this instance, the communication objective is clear: build levels of social and official trust among stakeholders. The problem identified (Step 1) and the dynamics of the stakeholder**

	groups analyzed (Step 2) determine the details of this objective.
PLANNING	
4	**Communication Strategy Development**
	While this entire strategy is the framework for ensuring effective communication in stakeholder participation, the CWM leaders need to determine who is responsible for communicating where the resources come from to conduct this communication and the indicators to use to measure the effectiveness of the communication as it relates to effective stakeholder participation. Based on the objectives identified in Step 3 above, one or more communication strategies may be more appropriate to achieve the goals of the collaborative (please refer back to Table 7). The strategies chosen are also be dependent upon the amount of trust among stakeholders (see Section 2.4.2) as well as the level of conflict and how it is managed (see Section 2.4.3). **See Section 3.4 for additional specifics regarding the most appropriate tools and methods for building stakeholder trust, which takes into account different methods for building trust as well as factors that influence stakeholder trust.**
5	**Participation of Strategic Groups**
	See Section 2.4.2 for the framework to determine what collaboration strategy is appropriate to encourage stakeholder participation based on each stakeholder groups' levels of social and official trust.
6	**Selection of Communication Method(s) based on Recommended Participatory Strategy**
	Based on the participatory strategy recommended, the best method(s) for communication (including, but not limited to, emails, surveys, public hearings, citizen juries/panels, or mediated negotiations) should be selected.
7	**Organizing the Details of the Communication Method**
	In order to encourage the participation of different stakeholder groups, messages "should fit the media selected" (Step 6) and "must be designed to suit the specific characteristics, educational and intellectual horizon and the aspirations" for the stakeholder groups involved in the CWM process (OECD, 1999, p. 32). Furthermore, when the communication involved is more collaborative in nature (e.g. a public hearing or mediated negotiation), the details of how this communication will occur, including what key points must be discussed and which stakeholders will be involved, must be hammered out in this stage.
8	**Final Preparation for the Selected Communication Method**
	If possible, a sample from the target stakeholder group is used to assess if the communication method chosen communicates the necessary information in order to achieve the goals of **in building levels of social and official trust among stakeholders**. In the case of dialogues among stakeholders and collaborative leaders (e.g. public hearings or mediated negotiations), this step would ensure ample advertisement for the event(s) and provide training (if necessary) to any participants regarding the communication process and/or to address any knowledge gaps prior to the main communication event.
ACTION & REFLECTION	
9	**Field Implementation**
	The communication method is implemented. Those in charge of implementation must ensure that the communication method has an appropriate timetable for presenting the message and, if part of the strategy, receiving the input requested. During this period, it would be wise to have "a good management information system that provides organizers with rapid feedback on important strategy activities and thus helps to readjust or change the strategy if necessary" (OECD, 1999, p. 35).
10	**Process Documentation and Monitoring and Evaluation (M&E)**
	Use the methods detailed in Sections **3.5** and **3.6** to measure whether or not the communication methods produced effective **in building levels of social and official trust among stakeholders**. Any significant findings at this step, as with any other of the steps, could cause a reiteration of parts or the entire process in order to increase success in achieving effective stakeholder participation.

Table 19. OECD's EC strategy as applied, adapted, and expanded by the author for collaborative communications in building trust among stakeholders. Adapted from *Environmental Communication: Applying Communication Tools Towards Sustainable Development* (Working Paper of the Working Party on Development Cooperation and Environment) by the OECD, 1999, Paris: OECD, pp. 13-36.

3.6 Measuring Successes

Adapting the framework utilized in Section 2.6 to measure successes in stakeholder participation, the following attributes are compiled from the literature cited earlier in the chapter with associated performance indicators developed by the author in order to adapt this framework to measure successes in efforts to build trust among stakeholders:

Table 20. Attributes of Success in Building Trust among Stakeholders in CWM and Associated Performance Indicators

Selected Attribute	Performance Indicator	Type of Indicator
The trust-building process allows full and active stakeholder representation	The proportion of all identifiable stakeholder groups that have taken part in stakeholder trust-building efforts; and	Behavioral
	The mechanisms used to attract, engage, and maintain the interest of stakeholders throughout the stakeholder trust-building effort	Behavioral
The trust-building process is accepted as legitimate by stakeholders	Participants' evaluation of the legitimacy of trust-building processes at various stages	Perceptual
Stakeholders understand each other's concerns	Internal and external stakeholders' ability to identify each other's concerns and understand the bases of those concerns	Behavioral
Stakeholders have both official and social trust (see Section 2.4.2)	The stakeholder's self-reported levels of trust and confidence in CWM officials and each other before and after implementing the trust-building strategy	Perceptual
Trust levels were improved by the measures taken	Judgments by internal and external stakeholders that trust-building strategies have led to increased social and/or official trust among stakeholders	Perceptual
Key decisions are accepted as legitimate by stakeholders	Participants' evaluation of the legitimacy of decisions for CWM activities before and after implementing trust-building strategies	Perceptual
Trust-Building strategies have helped in accomplishing the CWM mission	Trust-building strategies have helped the development and implementation of a decision integrating cost, schedule, environmental, safety, and health factors plus other external stakeholder concerns	Behavioral

Table 20. Attributes of success in building trust among stakeholders in CWM and associated performance indicators. Adapted from "Measuring the Success of Public Participation on Environmental Restoration and Waste Management Activities in the U.S. Department of Energy," by S. A. Carnes, M. Schweitzer, E. B. Peelle, A. K. Wolfe, and J. F. Munro, 1998, *Technology in Society, 20*(4), p. 403.

3.7 Application to CBSD

Since both CWM and CBSD involve collaboration, they necessarily both involve stakeholders who have varying levels of social and official trust. As described in this and previous chapters, trust is a crucial element in allowing for the successful implementation of collaborative efforts, whether it be specifically in a watershed or in an entire community. Therefore, the research and analysis of this chapter regarding building trust among stakeholders in CWM can directly inform practices in CBSD.

4. Conclusions

4.1 Guidelines of Best Practice

The culmination of this work is the production of guidelines of best practice for stakeholder participation and building trust among stakeholders in CWM, which then is applied to challenges in CBSD. While creating thorough guidelines of best practice is not within the scope of this research, the following seven main principles could form the foundation of such a guide.

Figure 16. Founding Principles for Best Practices in CWM & CBSD

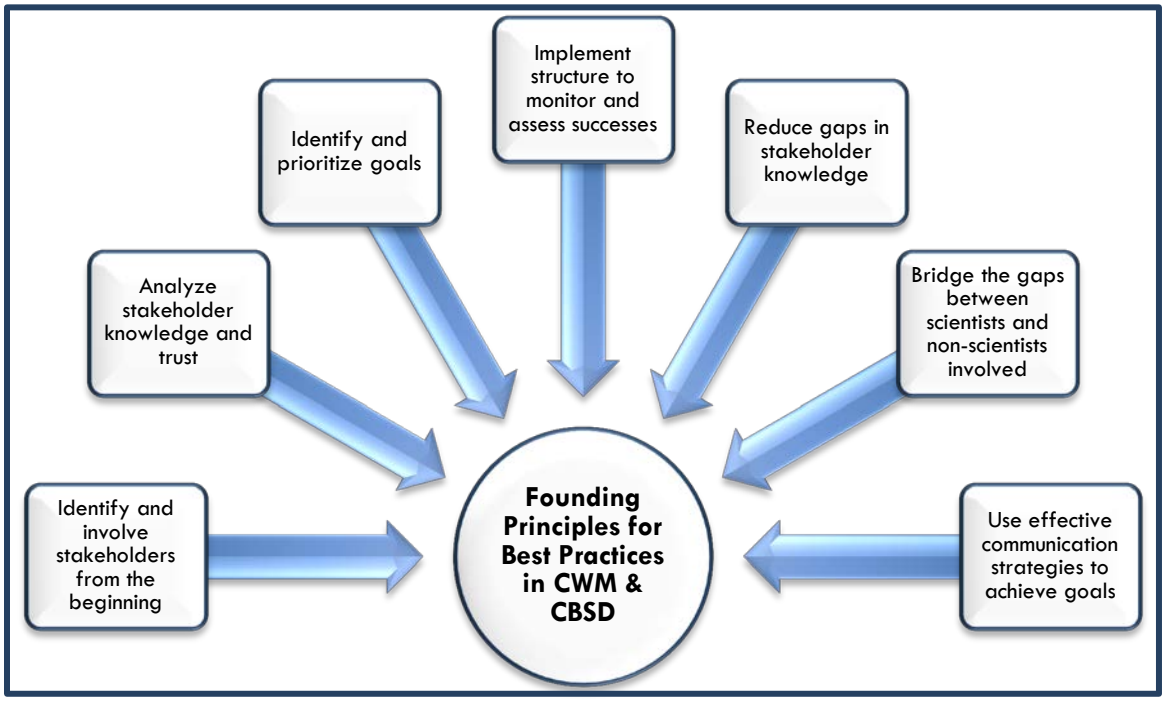

Figure 16. Seven founding principles for best practices in CWM and CBSD.

These founding principles for best practices can be applied directly to challenges for CBSD highlighted earlier in this research (see Section 1.2). As previously mentioned, adequately defining the "community" involved in CBSD can prove a difficult task for collaborative facilitators. By identifying and involving stakeholders from the onset of the CBSD program, facilitators can ensure to receive ample input on what various stakeholders consider the "community" involved in the sustainable development program. Through analyzing stakeholder knowledge and trust, facilitators can more accurately understand the dynamics of the community, including how stakeholders within the community could affect the outcomes

of the CBSD effort. In the beginning of a CBSD effort, it is important to identify and prioritize this goal of defining the community of interest and to implement a structure to monitor and assess successes (and failures) in achieving this goal. At this stage in the collaborative effort, reducing gaps in stakeholder knowledge could include providing scientific knowledge on ecosystems and habitats within them in order to broaden stakeholders' conception of their "community." Furthermore, discussions between scientists and non-scientists can help facilitators bridge the gaps between these stakeholder groups' conceptions of community to come up with a more complete understanding of the "community" forming the foundation of the CBSD effort. While pursuing this goal of identifying and defining the community of interest, it is important to use effective communication strategies in order to reach various milestones in accomplishing this overarching goal. Facilitators could use surveys to assess stakeholder knowledge and levels of social and official trust, as well as host discussion groups to facilitate stakeholders to brainstorm ideas together on how to define the community of interest for the CBSD effort.

Once the CBSD effort defines "community" and identifies its stakeholders, the next major challenge faced by CBSD efforts is creating a community-based vision and goals for sustainable development through collaboration among stakeholders. Figure 2 illustrates two conflicting views of conceptualizing CBSD: the constrained growth approach, which emphasizes the importance of economic growth, and the resource-maintenance approach, which emphasizes the finite nature of environmental resources and the importance of maintaining and protecting those resources. In order to achieve a consensus on what it means for a specific community to pursue a CBSD effort, facilitators should identify how stakeholders individually conceptualize CBSD; then, the effects of this conceptualization on stakeholder trust in officials and each other should be analyzed in order to identify any potential sources of conflict. At this point, the goal of collaborative effort is to reach a consensus on which approach is appropriate for the community and how that approach will inform CBSD efforts in the future. It is possible that stakeholders' conception of CBSD can change throughout the process; therefore, it could be beneficial to the collaborative to survey stakeholders periodically to see if attitudes have changed either independently or because of the CBSD effort. It is quite possible that many stakeholders (particularly landowners) do not have any knowledge of sustainable development or the different methods to conceptualize it. In this case, efforts should be made to reduce gaps in stakeholder knowledge; an effective communication strategy to

achieve this end might include public education meetings or pamphlets. Once again, it is important to measure successes in addressing these gaps—indicators measured through surveys are an easy way to accomplish this. Even if knowledge gaps are addressed, scientists and non-scientists in stakeholder groups are bound to have varying opinions on the appropriate approach; discussion (facilitated or mediated if there is significant social and/or official distrust) of these approaches between scientists and non-scientists would likely be the most effective communication strategy to accomplish the ultimate goal of creating a unified vision for the CBSD effort.

No two communities are like, so the implementation of these seven founding principles will be different in each situation. However, the two aforementioned challenges are likely to be encountered in any community pursuing a CBSD program. Furthermore, no matter what the ultimate goals of the collaborative are, there is bound to be significant gaps in stakeholder knowledge as well as gaps between scientists and non-scientists in the community. Therefore, in implementing any initiative, it is important to identify stakeholders early on in the process and utilize surveys or other communication methods to analyze stakeholder knowledge and trust. Through doing this, facilitators can improve their understanding of what gaps exist in stakeholder knowledge and between stakeholders and non-scientists; this improved understanding will allow facilitators to be more successful in identifying specific goals, implementing effective communication strategies to achieve them, and monitoring the successes of such efforts.

This research shows these seven founding principles form the cornerstone of successful collaborative efforts; however, it is important to note that these founding principles need to be adapted to the community at hand. For example, while the aforementioned examples note surveys as a potential communication method to assess stakeholder knowledge, a discussion group or citizen panel comprised of key stakeholders could accomplish the same task at a reduced cost in time and money. Ultimately, facilitators of CBSD efforts should utilize these seven founding principles as a guide, which they can adapt to the particular needs of any one community.

4.2 Areas for Future Research

Due to the limited scope of this research, as well as time constraints, not all pertinent points could be explored in detail. These areas listed below provide a starting point for further expansion of the concepts explored in this research:

- Detailed expansion of the summary guidelines of best practice highlighted above.
- Special considerations for dealing with certain stakeholders, including:
    - Native tribes (e.g. Native Americans in the US or aboriginals in Australia); and
    - Those with religious or spiritual beliefs that could impact the collaborative process:
        - This could include stakeholders who eschew modern technology (e.g. the Amish) or those who have a religious/spiritual connection to the watershed.
- Special considerations for dealing with the following unique situations when conducting CWM:
    - Watersheds located in a third-world country;
    - Watersheds in a place with a significantly different culture/value set; and
    - International concerns (e.g. CWM for the Rio Grande watershed between the US and Mexico)
- Additional aspects affecting collaboration in watershed management, including a more technical exploration of tools to implement specific strategies suggested in this research.
- Examination of specific case-studies analyzing specific aspects of strategies to foster stakeholder participation and building trust among stakeholders, including:
    - Economic feasibility study of strategies proposed;
    - Educational techniques to address gaps in stakeholder knowledge; and
    - Psychological aspects of trust building.

These specific considerations could have been expanded upon in almost every aspect of this research from increasing stakeholder participation to dealing with governments as a stakeholder (e.g. dealing with governmental regulations would be handled very differently in China versus in the US).

Appendix

Figure A1. Steps in the Watershed Planning and Implementation Process

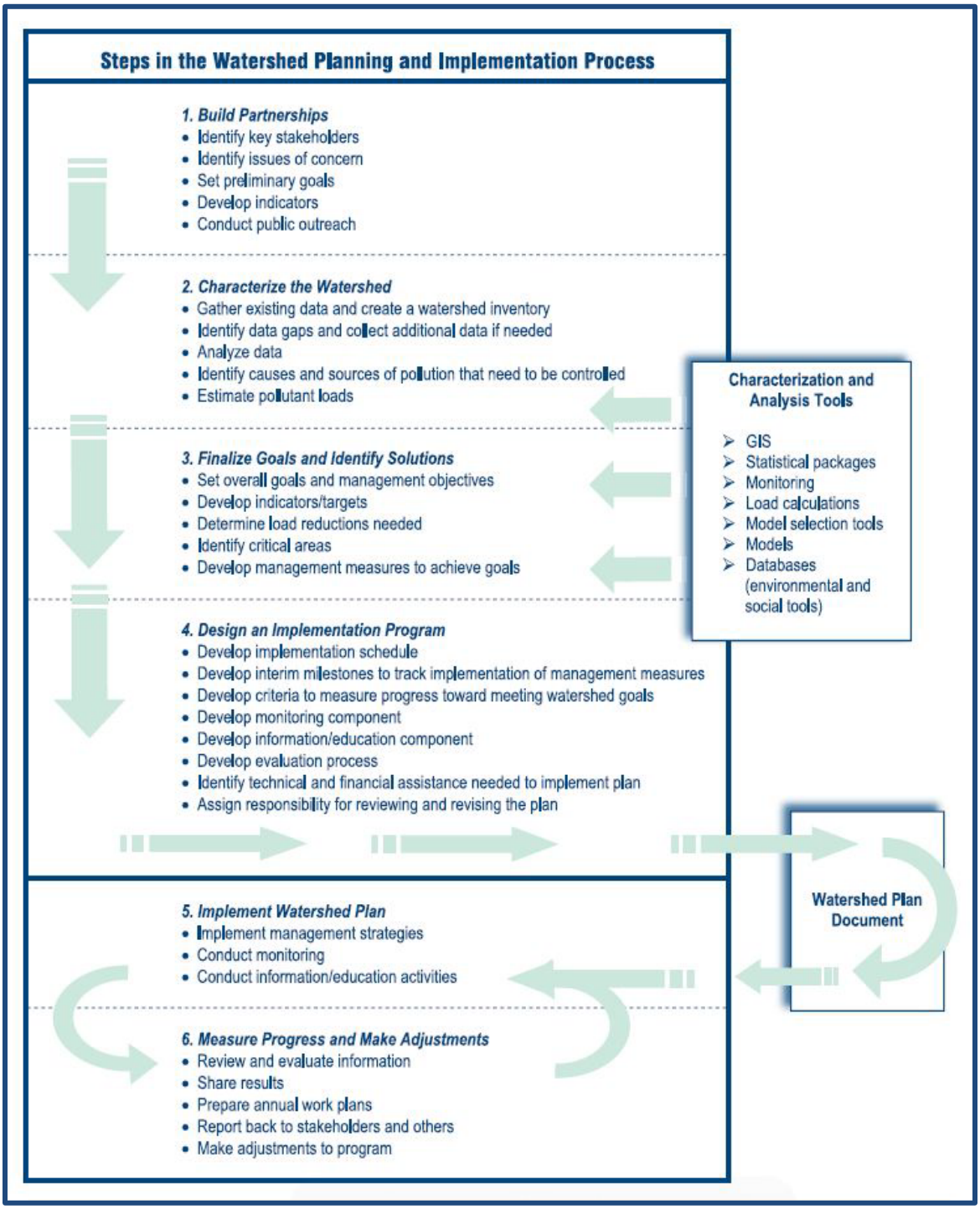

Figure A1. Steps in the watershed planning and implementation process. Reprinted from *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (EPA Document No. EPA 841-B-08-002) by the EPA, 2008, Washington, D.C.: EPA, p. 2-15.

References

Acheson, J. M. (2006). Institutional Failure in Resource Management. *Annual Review of Anthropology, 35*, 117-134. doi:10.1146/annurev.anthro.35.081705.123238

Agrawal, A., & Gibson, C. C. (1999). Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. *World Development, 27*(4), 629-649. doi:10.1016/S0305-750X(98)00161-2

Beierle, T. C. (1998). *Public Participation in Environmental Decisions: An Evaluation Framework Using Social Goals.* (Discussion Paper No. 99-06). Washington, D.C.: Resources for the Future. Retrieved from http://www.rff.org/RFF/Documents/RFF-DP-99-06.pdf

Beierle, T. C. (2002). The Quality of Stakeholder-Based Decisions. *Risk Analysis, 22*(4), 739-749. doi:10.1111/0272-4332.00065

Bekkering, M., & Eyles, J. (1998). Making a Region Sustainable: Governments and Communities in Action in Greater Hamilton, Canada. In M. D. Hoff (Ed.), *Sustainable Community Development: Studies in Economic, Environmental, and Cultural Revitalization* (pp. 139-162). Boca Raton, FL: CRC P.

Bonnell, J. E., & Koontz, T. M. (2007). Stumbling Forward: The Organizational Challenges of Building and Sustaining Collaborative Watershed Management. *Society & Natural Resources, 20*(2), 153-167. doi:10.1080/08941920601052412

Bridger, J. C., & Luloff, A. E. (1999). Toward an Interactional Approach to Sustainable Community Development. *Journal of Rural Studies, 15*(4), 377-387. doi:10.1016/S0743-0167(98)00076-X

Brody, S. D. (2003). Measuring the Effects of Stakeholder Participation on the Quality of Local Plans Based on the Principles of Collaborative Ecosystem Management. *Journal of Planning Education and Research, 22*(4), 407-419. doi:10.1177/0739456X03022004007

Buchy, M., & Hoverman, S. (2000). Understanding Public Participation in Forest Planning: A Review. *Forest Policy and Economics, 1*(1), 15-25. doi:10.1016/S1389-9341(00)00006-X

Campbell, J. T., Koontz, T. M., & Bonnell, J. E. (2011). Does Collaboration Promote Grass-Roots Behavior Change? Farmer Adoption of Best Management Practices in Two Watersheds. *Society & Natural Resources, 24*(11), 1127-1141. doi:10.1080/08941920.2010.512358

Carnes, S. A., Schweitzer, M., Peelle, E. B., Wolfe, A. K., & Munro, J. F. (1998). Measuring the Success of Public Participation on Environmental Restoration and Waste Management Activities in the U.S. Department of Energy. *Technology in Society, 20*(4), 385-406. doi:10.1016/S0160-791X(98)00024-4

Cash, D., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., & Jäger, J. (2002). *Salience, Credibility, Legitimacy and Boundaries: Linking Research, Assessment and Decision Making*. Cambridge, MA: KSG Working Papers Series. doi:10.2139/ssrn.372280

Chess, C., & Purcell, K. (1999). Public Participation and the Environment: Do We Know What Works? *Environmental Science & Technology, 33*(16), 2685-2692. doi:10.1021/es980500g

Condon, P. M. (2010). *Seven Rules for Sustainable Communities: Design Strategies for a Post-Carbon World*. Washington, D.C.: Island Press.

Conrad, E., Cassar, L.,F., Jones, M., Eiter, S., Izaovičová, Z., Barankova, Z., . . . Fazey, I. (2011). Rhetoric and Reporting of Public Participation in Landscape Policy. *J. Enviro. Policy & Planning, 13*(1), 23-47. doi:10.1080/1523908X.2011.560449

Corbett, J., & Corbett, M. (2000). *Designing Sustainable Communities: Learning from Village Homes*. Washington, DC: Island P.

Cox, R. (2010). *Environmental Communication and the Public Sphere* (2nd ed.). Los Angeles: SAGE.

Cronin, A. E., & Ostergren, D. M. (2007). Democracy, Participation, and Native American Tribes in Collaborative Watershed Management. *Society & Natural Resources, 20*(6), 527-542. doi:10.1080/08941920701338059

Daniel, J. R., Pinel, S. L., & Brooks, J. (2013). Overcoming Barriers to Collaborative Transboundary Water Governance. *Mountain Research & Development, 33*(3), 215-224. doi:10.1659/MRD-JOURNAL-D-12-00121.1

Daniels, S. E., & Walker, G. B. (2001). *Working Through Environmental Conflict: The Collaborative Learning Approach*. Westport, CT: Praeger.

EPA. (2008). *Handbook for Developing Watershed Plans to Restore and Protect Our Waters.* (EPA Document No. EPA 841-B-08-002). Washington, D.C.: EPA. Retrieved from http://water.epa.gov/polwaste/nps/handbook_index.cfm

Flitcroft, R. L., Dedrick, D. C., Smith, C. L., Thieman, C. A., & Bolte, J. P. (2009). Social Infrastructure to Integrate Science and Practice: the Experience of the Long Tom Watershed Council. *Ecology & Society*, *14*(2), 1-17. Retrieved from http://www.ecologyandsociety.org/vol14/iss2/art36/

Gooch, G. D., & Stålnacke, P. (Eds.). (2010). *Science, Policy and Stakeholders in Water Management: An Integrated Approach to River Basin Management*. Washington, DC: Earthscan.

Gregersen, H. M., Ffolliott, P. F., & Brooks, K. N. (2007). *Integrated Watershed Management: Connecting People to their Land and Water*. Cambridge, MA: CABI.

Grunig, J. E., & Grunig, L. A. (2006). Characteristics of Excellent Communication. In T. L. Gillis (Ed.), *The IABC Handbook of Organizational Communication: A Guide to Internal Communication, Public Relations, Marketing, and Leadership* (pp. 3-18). San Francisco, CA: Jossey-Bass.

Hardin, G. (1968). The Tragedy of the Commons. *Science, 162*, 1243-1248. doi:10.1126/science.162.3859.1243

Hart, M. (1999). *Guide to Sustainable Community Indicators* (2nd ed.). North Andover, MA: Hart Environmental Data.

Hawkes, J. (2001). *The Fourth Pillar of Sustainability: Culture's Essential Role in Public Planning*. Champaign, IL: The Humanities.

Hoff, M. D. (1998). Conclusion: Common Themes and Replicable Strategies. In M. D. Hoff (Ed.), *Sustainable Community Development: Studies in Economic, Environmental, and Cultural Revitalization* (pp. 229-239). Boca Raton, FL: CRC P.

IAP2. (2007). *Core Values of Public Participation*. Thornton, CO: IAP2.

Kauneckis, D., & Imperial, M. T. (2007). Collaborative Watershed Governance in Lake Tahoe: An Institutional Analysis. *International Journal of Organization Theory and Behavior, 10*(4), 503-546. Retrieved from http://search.proquest.com/docview/212017952?accountid=11667

Koontz, T. M., & Johnson, E. M. (2004). One Size Does Not Fit All: Matching Breadth of Stakeholder Participation to Watershed Group Accomplishments. *Policy Sciences, 37*(2), 185-204. doi:10.1023/B:OLIC.0000048532.94150.07

Koontz, T. M., & Thomas, C. W. (2006). What Do We Know and Need to Know about the Environmental Outcomes of Collaborative Management? *Public Administration Review, 66*(6), 111-121. doi:10.1111/j.1540-6210.2006.00671.x

Kumar, C. (2005). Revisiting 'Community' in Community-Based Natural Resource Management. *Community Development Journal, 40*(3), 275-285. doi:10.1093/cdj/bsi036

Leach, M., Mearns, R., & Scoones, I. (1997). Challenges to Community-Based Sustainable Development: Dynamics, Entitlements, Institutions. *IDS Bulletin, 28*(4), 4-14. doi:10.1111/j.1759-5436.1997.mp28004002.x

Leahy, J. E., & Anderson, D. H. (2008). Trust Factors in Community-Water Resource Management Agency Relationships. *Landscape and Urban Planning, 87*(2), 100-107. doi:10.1016/j.landurbplan.2008.05.004

Livermore, M., & Midgley, J. (1998). The Contribution of Universities to Building Sustainable Communities: The Community University Partnership. In M. D. Hoff (Ed.), *Sustainable Community Development: Studies in Economic, Environmental, and Cultural Revitalization* (pp. 123-138). Boca Raton, FL: CRC P.

Lundgren, R. E., & McMakin, A. H. (2009). *Risk Communication: A Handbook for Communicating Environmental, Safety, and Health Risks* (4th ed.). Hoboken, NJ: Wiley.

Luyet, V., Schlaepfer, R., Parlange, M. B., & Buttler, A. (2012). A Framework to Implement Stakeholder Participation in Environmental Projects. *Journal of Environmental Management, 111*, 213-219. doi:10.1016/j.jenvman.2012.06.026

Mandarano, L., & Paulsen, K. (2011). Governance Capacity in Collaborative Watershed Partnerships: Evidence from the Philadelphia Region. *Journal of Environmental Planning & Management, 54*(10), 1293-1313. doi:10.1080/09640568.2011.572694

Maser, C. (1997). *Sustainable Community Development: Principles and Concepts*. Delray Beach, FL: St. Lucie P.

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts. *Academy of Management Review, 22*(4), 853-886. doi:10.5465/AMR.1997.9711022105

Morsing, M., & Schultz, M. (2006). Corporate Social Responsibility Communication: Stakeholder Information, Response and Involvement Strategies. *Business Ethics: A European Review, 15*(4), 323-338. doi:10.1111/j.1467-8608.2006.00460.x

Nielsen, J. R., & Vedsmand, T. (1999). User Participation and Institutional Change in Fisheries Management: a Viable Alternative to the Failures of 'Top-Down' Driven Control? *Ocean & Coastal Management, 42*(1), 19-37. doi:10.1016/S0964-5691(98)00085-4

OECD. (1999). *Environmental Communication: Applying Communication Tools Towards Sustainable Development.* (Working Paper of the Working Party on Development Cooperation and Environment). Paris: OECD. Retrieved from http://www.oecd.org/environment/environment-development/2447061.pdf

Parker, L. J. (1997). *Environmental Communication: Messages, Media & Methods*. Dubuque, IA: Kendall/Hunt.

Pintér, L., Hardi, P., Martinuzzi, A., & Hall, J. (2012). Bellagio STAMP: Principles for sustainability assessment and measurement. *Ecological Indicators, 17*(0), 20-28. doi:10.1016/j.ecolind.2011.07.001

Pirson, M., & Malhotra, D. (2011). Foundations of Organizational Trust: What Matters to Different Stakeholders? *Organization Science, 22*(4), 1087-1104. doi:10.1287/orsc.1100.0581

Putnam, R. (1993). The Prosperous Community: Social Capital and Public Life. *The American Prospect, 13*, 35-42. Retrieved from http://prospect.org/article/prosperous-community-social-capital-and-public-life

Rabe, B. G., & Gaden, M. (2009). Sustainability in a Regional Context: The Case of the Great Lakes Basin. In D. A. Mazmanian, & M. E. Kraft (Eds.), *Toward Sustainable Communities: Transition and Transformations in Environmental Policy* (2nd ed., pp. 289-314). Cambridge, MA: MIT P.

Reed, M. S. (2008). Stakeholder Participation for Environmental Management: A Literature Review. *Biological Conservation, 141*(10), 2417-2431. doi:10.1016/j.biocon.2008.07.014

Rhoads, B. L., Wilson, D., Urban, M., & Herricks, E. E. (1999). Interaction between Scientists and Nonscientists in Community-Based Watershed Management: Emergence of the Concept of Stream Naturalization. *Environmental Management, 24*(3), 297-308. doi:10.1007/s002679900234

Roseland, M. (2005). *Toward Sustainable Communities: Resources for Citizens and Their Governments* (Revised ed.). Gabriola Island, BC, Canada: New Society.

Rowe, G., & Frewer, L. J. (2000). Public Participation Methods: A Framework for Evaluation. *Science, Technology, & Human Values, 25*(1), 3-29. doi:10.1177/016224390002500101

Ryan, C. M., & Klug, J. S. (2005). Collaborative Watershed Planning in Washington State: Implementing the Watershed Planning Act. *Journal of Environmental Planning and Management, 48*(4), 491-506. doi:10.1080/09640560500128384

Sabatier, P. A., Focht, W., Lubell, M., Trachtenberg, Z., Vedlitz, A., & Matlock, M. (Eds.). (2005). *Swimming Upstream: Collaborative Approaches to Watershed Management* (Google Books ed.). Cambridge, MA: MIT P. Retrieved from https://play.google.com/store/books/details?id=Cw5FKKMqikoC

Stedman, R., Lee, B., Brasier, K., Weigle, J. L., & Higdon, F. (2009). Cleaning Up Water? Or Building Rural Community? Community Watershed Organizations in Pennsylvania. *Rural Sociology, 74*(2), 178-200. doi:10.1111/j.1549-0831.2009.tb00388.x

Townsend, R. E., & Pooley, S. G. (1995). Corporate Management of the Northwestern Hawaiian Islands Lobster Fishery. *Ocean & Coastal Management, 28*(1–3), 63-83. doi:10.1016/0964-5691(95)00043-7

UNECE. (2012). Public Participation. Retrieved September 10, 2012, from http://www.unece.org/env/pp/welcome.html

van den Belt, M. (2004). *Mediated Modeling: A Systems Dynamics Approach to Environmental Consensus Building*. Washington, DC: Island P.

Varjopuro, R., Gray, T., Hatchard, J., Rauschmayer, F., & Wittmer, H. (2008). Introduction: Interaction between Environment and Fisheries—The Role of Stakeholder Participation. *Marine Policy, 32*(2), 147-157. doi:10.1016/j.marpol.2007.09.001

Walker, G. B. (2004). The Roadless Areas Initiative as National Policy: Is Public Participation an Oxymoron? In S. P. Depoe, J. W. Delicath & M. A. Elsenbeer (Eds.), *Communication and Public Participation in Environmental Decision Making* (pp. 113-135). Albany, NY: State U of NY P.

WCED. (1987). *Our Common Future.* (Annex to document No. A/42/427). New York: UN. Retrieved from http://www.un-documents.net/our-common-future.pdf

Wondolleck, J. M., & Yaffee, S. L. (2000). *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*. Washington, D.C.: Island P.

WSSD. (2002). *Johannesburg Declaration on Sustainable Development.* (AnnexBi to document No. A/CONF.199/20). New York: UN. Retrieved from http://www.un-documents.net/jburgdec.htm

Yanarella, E. J., & Levine, R. S. (1992). Does Sustainable Development Lead to Sustainability? *Futures, 24*(8), 759-774. doi:10.1016/0016-3287(92)90105-O