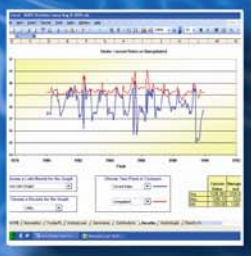
Shared Vision Planning

January 2009

The Shared Vision Planning Primer: *How to incorporate computer aided dispute resolution in water resources planning*

2008-R-02



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Shared Vision Planning

The Shared Vision Planning program at the Institute for Water Resources (IWR) uses an innovative, collaborative approach to solve water resources management issues. It integrates traditional water resources planning methods, structured public participation, and collaborative computer modeling into a multifaceted planning process. This program is unique because it emphasizes public involvement in water resources management and the use of collectively developed computer models along with tried-and-true Corps planning principles.

Shared Vision Planning aims to improve the economic, environmental and social outcomes of water management decisions. By involving stakeholders throughout the planning process, the Shared Vision Planning process can facilitate a common understanding of a natural resource system and help stakeholders reach a management consensus that satisfies multiple interests. Shared Vision Planning allows IWR scientists to work directly with stakeholders to find acceptable solutions to issues surrounding the management of water resources.

Collaborating for Improved Water Resources Management

Through its Shared Vision Planning Program, IWR is applying the principles of public involvement and collaborative computer modeling to a series of water resources management case studies across the United States. Analyses, documents, and an enhanced web presence are being developed to impart the method and lessons of Shared Vision Planning to the wider planning community. All of these initiatives are designed to help planners and stakeholders use a collaborative approach to natural resources management.

By recognizing the importance of multiple stakeholder interests and the value of innovative technological support, Shared Vision Planning can make a positive impact on the current and future management of our nation's water resources. The Shared Vision Planning Program at IWR is developing partnerships with other organizations to more effectively implement this approach. The Program has already helped numerous stakeholders in previous projects to find acceptable water management solutions, and IWR looks forward to the continued spread and success of this planning approach.

For further information on the Shared Vision Planning program, please contact Hal Cardwell, 703-428-9071, Hal.E.Cardwell@usace.army.mil.

To learn more, please visit the Shared Vision Planning web site: www.sharedvisionplanning.us

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Georgia's Water Crisis: 'A wake-up call' for better planning

--Atlanta Journal-Constitution (December 11, 2007)

Water Management Officials Warn Central Florida is on Verge of Crisis

--Orlando Sentinel (November 27, 2001)

The American Southwest: Are We Running Dry?

--Forbes (November 9, 2007)

Warming Will Exacerbate Global Water Conflicts

--The Washington Post (August 20, 2007)

Humans and Wildlife Face Water Woes.

--USA Today (January 1, 2007)

Houston Narrowly Avoids a Water Crisis

--The New York Times (September 28, 2005)

Cost of Water Shortage: civil unrest, mass migration and economic collapse –

Analysts see widespread conflicts by 2015 but pin hopes on technology and better management

--The Guardian (August 17, 2006)

Reservoir Debate Coming Up Dry –

Seventeen Years after Proposal, Environmental Groups Still Stalling Action on Project

--The Virginia Pilot (February 16, 2004)

Oregon Governor Warns of Columbia Water Crisis

--Seattle Post-Intelligencer (August 17, 2001)

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PREFACE

As the headlines demonstrate, water conflicts are becoming increasingly common. This is not surprising, as both the increasing global population and climatic changes are affecting supply and demand of natural resources. At the same time, since the environmental movement started in the 1970's, stakeholders have found – and exerted – their voice in natural resources decision making, whether through legal action, protests, or participation in the planning process.

Ideally, if we plan and manage our water resources effectively, we will prevent or at least reduce the number and intensity of conflicts. Shared Vision Planning is one tool that can successfully bring stakeholders, technical information, and decision makers together at one table, and in doing so support better water management.

ACKNOWLEDGEMENTS

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TABLE OF CONTENTS

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1. OVERVIEW

Shared Vision Planning (SVP) has been used in water resources studies and the Corps since the early 1990s. But, what is it? Why use it? This primer provides an overview of SVP and describes how SVP can meet the challenges present in water resources planning today.

Section 2 provides the current context for water resources planning, including changes in recent decades and the challenges faced by planners in the Corps and elsewhere today. Section 0 describes Shared Vision Planning and how its combination of traditional water resources planning methodologies, structured collaboration, and the use of technical modeling helps address these challenges. Section 0 provides a simple example of what a Shared Vision Planning process might look like in order to illustrate what these principles mean in practice. Section 5 summarizes and provides final remarks, while Section 6 provides a list of additional resources.

Shared Vision Planning

Shared Vision Planning is a disciplined planning approach that incorporates traditional water resources planning methodologies, structured public participation, and the use of collaborative modeling in the creation of an integrated decision support tool.

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2. CURRENT CHALLENGES IN WATER RESOURCES DECISION MAKING

Water resources decisions are different now than fifty years ago at the height of the dam building era, or even twenty-five years ago when the Principles and Standards (Water Resources Council, 1973) and the Principles and Guidelines (Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, Water Resources Council, 1983) were developed. Today, when you – the Corps staff of the 21st century – have to make planning, permitting, or operational decisions, you have to face new challenges: complexity, conflict, limited knowledge and uncertain wants, and lack of trust.

Complexity. More often than not, decision-makers are not confronted with a straight-forward, single objective problem. Complex, multi-objective problems are obviously not new, but interest and understanding of complex hydrologic, ecological, economic, and social processes and their interactions have deepened. There is a growing expectation that this knowledge be accompanied by a better understanding of the linkages and relationships between these multiple processes. Water resource decisions are accompanied by increasingly active and diverse sets of stakeholder groups. Thus, most Corps decisions require analysis of complex sets of cause and effect relationships that give rise to multiple outcomes and impacts.

For the Corps, understanding and analyzing outcomes for the numerous different alternatives to a water resources problem requires skills and knowledge from multiple professional disciplines - engineering, ecology, economics, as well as an appreciation for the political climate in which planning takes place.

Conflict. Because so many different types of stakeholders are involved and interested in water resources decisions, conflict is inevitable. To deal with the conflict we have to understand it. Is the disagreement over *facts* or is the disagreement over *values* and *preferences*? Conflict might arise over technical questions (the facts) such as the impact of drought on instream flow, or how a particular river flow might affect a fishery. Conflict might also arise on questions of what stream flow *should be* (i.e., conflicting values and preferences). Stakeholders may all agree that a certain river flow pattern is good for a non-native recreational fishery but vehemently disagree on whether this species should be in the river in the first place.

Neither type of conflict can be completely resolved by technical analysis. Conflict over facts can be reduced with generally better knowledge and technical analysis, but getting agreement on the facts will be made much more difficult if stakeholders do not trust the experts or do not find the analysis credible. Further, additional technical studies won't get you anywhere in resolving values conflicts. How people answer such questions depends on the personal, social, or ethical values they place on the outcomes of a

decision. When we mistakenly assume that more analysis, more science, or better data will resolve conflict over value questions, this pursuit of technical answers only gets in the way of more productive debate related to values. Furthermore, technical analysis can be misused to win political advantage or to obscure stakeholder objectives, rather than to learn more about the problem or to facilitate discussion over the merits of what should happen.

The Corps now must develop analytical and planning strategies to cope and manage with these different types of conflict. They need to have both analytical tools (scientific and engineering techniques) and the process tools (process design, facilitation and public involvement techniques), as well as a way to link both types of tools in order to guide a multi-stakeholder process to a successful conclusion.

Limited Knowledge and Uncertain Wants. Much of the knowledge we need to best manage our natural resources may not come from professional or academic training but instead through hands-on experience. Similarly, people frequently learn what they want and what their desires are through experience with a particular problem. If people make choices infrequently or must make choices about a complex and unfamiliar problem, they may have vaguely formed notions of what is at stake and what the consequences of an alternative means to them. For instance, a particular non-governmental organization (NGO) may be generally interested in protecting aquatic resources downstream of an existing or proposed dam, but enter the debate without the knowledge that two fish species respond differently to different downstream flow conditions. In the process of learning about the consequences of different alternatives and confronting an unanticipated tradeoff, the group will learn about the relative importance they place on each species.

The Corps must recognize that stakeholder objectives and preferences can and do change substantially in the course of a decision. A decision process that encourages learning and discovery will develop more opportunities for people to find mutually satisfactory alternatives than one that does not.

Lack of trust. Communication and personal relationships in public decision-making processes play a vital role in the in the negotiation process. Getting different people with different agendas to work toward a mutually satisfactory outcome is much more difficult in an atmosphere of distrust. Unfortunately, mistrust and suspicions often run high in many decisions involving water resources. If trust exists among decision participants (even in the face of disagreement or conflict), people will be more honest in revealing what is important to them, more likely to help others meet their goals, and less likely to sabotage a process. If relationships between competing groups of people can be strengthened during the course of a decision, the resulting outcomes will likely be less costly and more satisfactory to a larger number of people.

In a water resources context, the Corps must earn the trust of the stakeholders and create a process that builds trust among them.

Any of these challenges on their own can elude success in a water resources decision-making process, and the four of them together can cause crises as shown in the headline examples in the front of this primer. Techniques that can address these challenges can help avoid big controversies. Shared Vision Planning is one method that can help.

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3. THE CONCEPT OF SHARED VISION PLANNING

Shared Vision Planning (SVP) is designed to address complexity, manage conflict, promote learning and understanding, and build relationships between stakeholders. These characteristics of SVP increase the chances for facilitating constructive dialogue among stakeholders and reaching agreements on workable solutions.

SVP combines collaboration and technical analysis with traditional planning principles. While each of these elements is broadly familiar to most Corps practitioners, what is unique about SVP is how technical expertise and analysis is integrated into a collaborative planning process. The traditional planning process is organized around an analytical (decision support) computer model of the water resource system constructed with the participation of stakeholders. This collaboratively-built model is designed to support stakeholder dialogue with joint learning and discovery about both the water resource system and the perspectives and objectives of all stakeholders. This kind of dialogue increases the chance that mutually acceptable solutions will be developed.

What's different?

- The extensive use of ***integrated computer*** models sets SVP apart from other collaborative processes.
- The ***collaborative nature of the modeling*** sets SVP apart from traditional technical analysis.

If you are already combining modeling, collaboration and planning, we'd like to hear your stories so please let us know!

The Three Pillars of Shared Vision Planning

There are three pillars that support SVP: traditional water resources planning, structured public participation, and an integrated computer model. There are numerous examples among the experience of the Corps and in the larger body of published case studies of approaches that contain two of these pillars, and some that do contain all three. SVP, by definition, contains all three pillars, but is also distinguished by how each pillar supports the process, and how it is combined with the other pillars. For example, in contrast with Multi-Criteria Decision Analysis which focuses on the evaluation of alternatives, SVP places more emphasis on the process of generating mutually-agreed upon objectives and alternatives that reflect the breadth of stakeholders interests and needs. As a result, alternatives may be formulated that are outside of the Corps purview to implement, but that may meet the study objectives and needs. Public participation has become common in resource management, but authority and contributions are typically limited to comments on plans developed by a limted number of experts. In contrast, SVP processes seek active participation by representative stakeholders who contribute throughout the entire process from developing objectives and gathering data to evaluating alternatives, Similarly, computer models have typically been "black boxes" developed by a few technical experts. In SVP, the model supports the whole collaborative planning process

by incorporating the breadth of stakeholder perspectives, providing a common focus and language for discussion, revealing complex linkages and assumptions, and encouraging cooperation to identify mutually-agreeable solutions. These services, combined with the fact that the participants interact with the model directly throughout the process, require a model that is more integrated, tranparent, user-friendly, and flexible than a conventional model.

Pillar I: Traditional Water Resources Planning

The planning steps for SVP are closely related to the steps in the traditional planning process based on the Principles and Guidelines and described in the IWR Planning Manual (IWR 1996). However, what SVP introduces is the reliance on formal stakeholder involvement throughout the planning process. Figure 1 shows how Collaborative Planning builds upon the Traditional Planning Process.

Pillar II: Structured Public Participation

SVP involves stakeholders early and often during both the planning and the technical analysis. Rather than involving the entire public through open forums, SVP uses Circles of Influence (COI) to engage different stakeholders in varied formats and levels of intensity (Figure 2). COI groups participants according to their role in the study, while maintaining lines of communication between the groups so that nobody is closed off from any part of the study.

Because not everyone is equally motivated or available to participate, COI helps to make the most efficient use of stakeholders' time. Figure 2 describes four primary roles that participants can play: (A) Model builders; (B) Model users and validators; (C) All interested parties; and (D) Decision makers. Members of Circles B and C provide information to support development of the model (communicating to Circle A). The model tracks and organizes this information, enabling all parties (particularly B and C) to understand the system more clearly. The COI structure allows and encourages open communication throughout the engagement process. This openness helps to develop trust among the different parties and to foster respect for each others' interests and values.

Stakeholders may participate in all stages of the study. For example, they may contribute by:

- Identifying metrics and objectives that can be used to evaluate the state of the problem and measure responses to interventions.
- Identifying data and developing methods (models) that predict the impacts of different alternatives.
- Formulating and modifying alternatives.
- Debating the relative merits of available alternatives and perhaps selecting between competing alternatives.

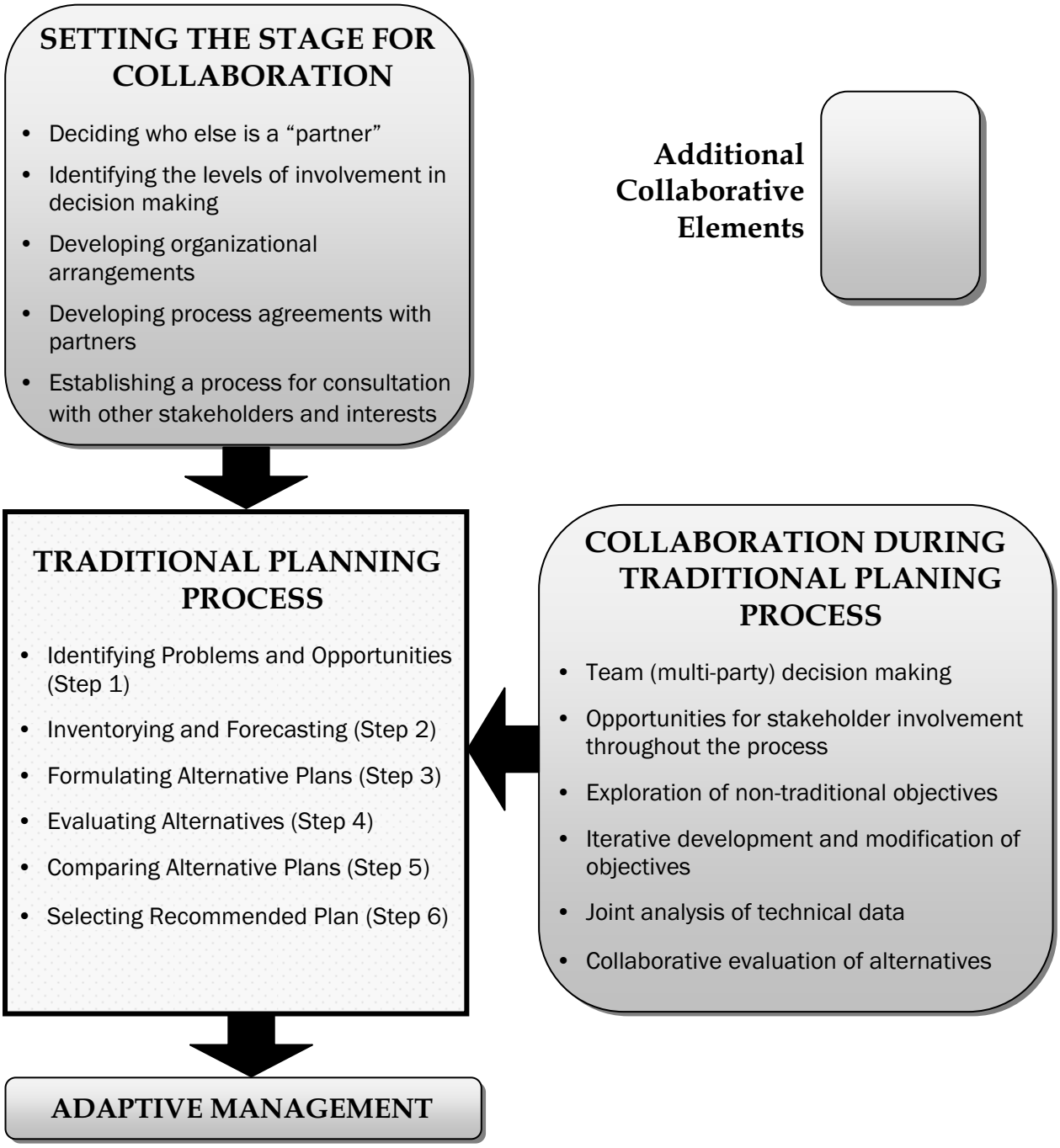
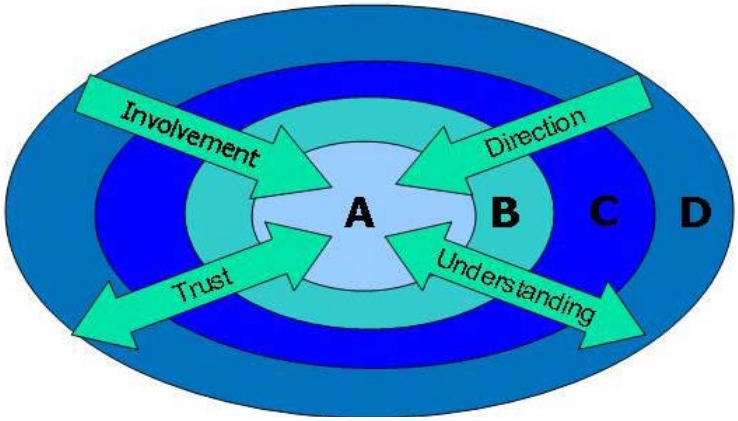


Figure 1: What Makes Planning "Collaborative?"



Circle A
Model Builders

The primary model building team. Integrates the work of others to produce a broadly accepted and trusted Shared Vision Planning Model (SVPM). Facilitates communications among stakeholders, decision-makers and the public. Should be a multi-disciplinary team with knowledge about all the major issues.

Circle B
Model Users & Validators

Usually consists of several workgroups focused on particular issues (e.g., recreational impacts). Each group is made up of technical experts and/or stakeholder representatives. Workgroups produce technical work to be used by Circle A for the SVPM. Circle B validates the work of Circle A and uses the SVPM to test and evaluate plans.

Circle C
All Interested Parties

Often considered the general public. A much larger group than Circles A or B and may be informal. Interested parties in Circle C should see their interest represented in Circle B and should have formal opportunities to shape the work of Circles A and B. Ideally, members have a contact in Circle B who represents their interests.

Circle D
Decision Makers

Those who have an authoritative role in accepting or rejecting the recommendations generated through the SVP, be it a steering committee formed to run the study or the District Commander and the lead for your cost-share partner. The decision-makers should be clearly identified and engaged throughout the planning process. Decision-makers receive information from the other Circles and provide direction for executing the study.

Figure 2: The Circles of Influence Approach to Collaboration

Pillar III: An Integrated Computer Model

The central focus of a SVP process is on the development and use of a computer model of the study area's water resources system. The model describes basic cause and effect relationships between different elements in the system in order to provide a description of what the future might look like under different alternatives. A unique feature of the shared vision model is that it is collaboratively constructed by technical analysts and stakeholder groups. The computer model is designed to produce information on outcomes (metrics) that are identified by stakeholders themselves. Stakeholders support development of the model by collecting data, formulating causal relationships, and reviewing and verifying the model. The computer model allows users to develop and explore alternatives. Throughout development, the model becomes a common avenue for stakeholders to develop a shared understanding of the water resource system and to debate alternatives.

In SVP, a cause-and-effect model is jointly constructed with technical analysts and stakeholders. This model serves as the focal point for discussions of objectives, alternatives, and outcomes.

In order to promote and support collaborative planning, a model used in SVP has four key features.

Integrated. A SVP model is based on a systems approach, such that they integrate all issues relevant to the decision, to the extent possible. A SVP model characterizes the relationships between water management decisions and the various environmental, economic and social impacts of concern to stakeholders and decision-makers. Generally a system model should be as simple as possible while still providing useful insights. A systems model may be broader in scope but have less detail than conventional technical models. If needed, models of varying levels of detail may be used at different stages in the SVP process.

Transparent. A SVP model must be transparent with respect to input data, assumptions and the way outputs are produced. Transparency allows stakeholders to understand the causal relationships in the system (e.g., as seasonal precipitation decreases, irrigation water demand increases). The model allows stakeholders to understand, visualize, and verify information and relationships. The transparent nature of the model forces participants to explicitly and clearly communicate their knowledge, objectives, interests, and values.

SVP relies on transparent, user-friendly systems models to promote learning and build trust in the technical analysis.

User-Friendly. SVP emphasizes opportunities for stakeholders to engage in the technical analysis. This is made easier by designing models that can be used by people who are not professional modelers. SVP models should include interactive features and clear documentation so that stakeholders can play what-if games and test their own ideas. A SVP model is not unlike a WaterSim-type game where users can engage in virtual management of the water resource system under investigation.

Flexible. SVP can be readily modified to address new questions and ideas emerging throughout the process. Model flexibility includes the ability to (1) modify/refine technical model relationships and data, (2) incorporate and evaluate new alternatives in the model, and (3) add or modify model outputs and performance metrics. Such flexibility accommodates joint learning and discovery.

How SVP Can Improve Decision-Making

SVP improves decision-making by refining everyone's understanding, values and preferences, by developing a shared understanding of the facts about the system, by elucidating the tradeoffs of various alternatives, and by fostering trust in the model and its output.

> SVP helps to focus discussion not on the individual or interest-based agendas but on the trade-offs between an array of alternatives.

Unfortunately, today it is common for environmental decision-making to begin in an atmosphere of distrust and guardedness. The extensive stakeholder engagement with the planning and modeling process helps develop trust in the analysts leading the process and the results of the work they do. Furthermore, the dialogue and collaboration between stakeholders helps to foster mutual respect, changing attitudes from competition to cooperation.

Collaboration within this planning and modeling process promotes important kinds of learning about the water resource system. Traditional planning provides effective techniques for dealing with multiple objectives and impacts. The systems approach is well-suited for modeling the complex interactions between different physical and social processes. As stakeholders participate in model construction and interact with the model itself, they gain an understanding of how the water resources system works and what its impacts might be. Further, the process of testing ideas with the model helps stakeholders refine their understanding of their own values and preferences. With greater learning and understanding, stakeholders can engage in productive dialogue to identify mutually acceptable solutions.

When there are disagreements over the technical information (i.e., the facts) no amount of planning or modeling will generate broadly acceptable solutions. By emphasizing collaboration, especially in technical activities, SVP first helps to reduce conflict over the facts. Stakeholders within a SVP process all work from the same tool—they can interact with the model, they can see how it works, they can access input data, and they can read about key assumptions driving the model. And beyond this, stakeholders are given opportunities to influence decisions about model design and development. In essence, the integrated, transparent, and easy-to-use model serves as a "single text negotiating tool"—a well worn notion in the conflict resolution field.

Conflicts about values and preferences are inevitable and to be expected. Different stakeholders have different interests and different ideas about what is good for society for the environment. In many instances, alternatives that make one stakeholder group better

off will impose costs on another group. A shared vision model is constructed to explicitly highlight such conflict and focus discussion on trade-offs. The model clearly shows who bears costs and who benefits from alternatives. The flexibility of the model encourages stakeholders to search and evaluate new alternatives that will achieve more benefits for more stakeholders. Note that shared vision models are not designed to calculate the "best" or optimum answer based on a decision rule, and that the participants may not be required to unanimously agree on one preferred alternative.

During the process of building the model, investigating alternatives, and discussing choices, a shared vision process represents a joint learning process. Stakeholders not only learn more about the problem, they also learn more about the problems and concerns of others. Such personal relationships build social trust and provide encouragement to work toward mutually agreeable alternatives. Equally important though, stakeholders have a greater opportunity to learn about their own wants and preferences. Stakeholders may discover that their original objective is not as relevant or important as a new one that emerges out of the group discussions. Enhancing the opportunity to learn -- to learn from others, to learn about others, and to refine your own knowledge and values -- is one of the primary features and advantage to a shared vision approach to decision-making.

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4. SHARED VISION PLANNING IN PRACTICE

What might a Shared Vision Planning study look like in practice? This section illustrates how a SVP process might be implemented. The intention is not to provide step-by-step guidance, but rather to focus on the unique aspects of SVP – how planning and collaboration interface with the construction of a model to help solve real problems. More details on Shared Vision Planning, including descriptions of case studies, a Step-by-Step Demonstration, a peer-reviewed paper, and additional links are available at: www.sharedvisionplanning.us.

Case Study: The Blue River Watershed

There are two towns on the Blue River. The town of Centreville is growing substantially, so plans to meet the growing water demand by increasing withdrawals from the Blue River. The town of Smallville has a stable population, but benefits from a thriving recreational industry of fishing and boating on the river. The people of Smallville are worried that additional withdrawals may reduce fish habitat and limit boat access, which could hurt their recreation community. In addition, the Blue River is connected to several important wetland areas. Some of these wetlands are already degraded and local environmentalists are worried that additional water supply withdrawals could further impact the ecosystem. An existing Corps reservoir upstream from the towns could play a significant role in addressing these problems, but it might need infrastructure upgrades and will almost certainly need a revised operations strategy.

Because of the growing controversy over this situation, the Corps has received funding to study the issues. Congressman Johnson was instrumental in securing the funding for this study and has met numerous times with the Corps' district commander, with representatives from both towns, and with an environmental NGO interested in doing some work on the wetlands. As the Corps' lead planner for the Blue River Watershed Study, you face many challenges:

- A watershed study must consider multiple objectives so you need to develop a plan that addresses all the issues described above, and maybe others you haven't heard about yet.
- A variety of stakeholders are already engaged with the problem. They are eager to know what the Corps is going to recommend and how it is going to generate these recommendations. You have to involve them as much as possible if the study has any hope of identifying workable solutions.
- Several stakeholders are working their political connections regarding this issue. This highlights the need for a level playing field and a transparent planning process.
- Several studies have already been conducted on some of the issues your watershed study will address. The NGO produced a short report on the state of the Blue River wetlands, plus consultants for both towns have recent reports on regional growth, water supply and recreation. There is a 10-year-old

Environmental Impact Statement (EIS) produced by the Corps to support a permitting process for a new power plant. The power plant was built on another river, but the EIS contains a lot of technical information on Blue River hydrology and ecology. Some of these studies have conflicting information and conclusions.

- The communities are providing 50% of the funding for the project, so are determined to provide constant direction.

In summary, you have multiple stakeholders interested in different sets of issues, each with different levels of power and political influence. They each seem to rely on different scientific conclusions to back up their arguments and many are suspicious of one another. SVP can help you navigate this potentially messy situation.

Preparation

During the preparation phase your main task is to identify and invite appropriate stakeholders to participate in the study. Talk to potential participants to identify their issues of concern and to learn more about the watershed. Begin designing the collaborative modeling process in a way that will make the best use of their knowledge and time.

> ***In SVP, we want to involve...***
>
> - Stakeholders who can affect or are affected by the decision;
> - Decision-makers needed to affect the solution, *and*
> - Experts who can inform the solution

To determine ***who to involve,*** there are a few general rules to follow. First, identify potential stakeholders through interviews, referrals, web searches, and/or hosting public meetings. Then, ask yourself if each potential participant fits into one of these general roles: (1) Stakeholders who can affect or are affected by the decision; (2) Decision-makers needed to affect the solution; or (3) Experts who can inform the solution. For the Blue River Watershed Study, the obvious ones (aside from your cost-sharing partner) are water supply planners from each town, representatives from the recreation industry around Smallville, the environmental NGO, a local environmental group, and perhaps a representative from a state or federal environmental agency such as the Fish and Wildlife Service. If you think more broadly you might identify other stakeholders. What about a local chamber of commerce? How about land use planners from each town? Should a staffer for Congressman Johnson play a role? Maybe a professor from a local university is the expert on Blue River ecology. The key is to ***be inclusive*** so that your study involves people who can represent all of the major issues. If you think the level of conflict is high enough you may want to engage a neutral to identify the stakeholders, by going into the community and conducting a stakeholder assessment.

Once you have an idea of who to involve, you need to organize all the participants so that your study is efficient and manageable. You may find that not every interested individual will be able to fully participate in every aspect of the study. To make the best use of stakeholders' knowledge and time, the collaborative process should be structured so that

each stakeholder has some opportunity to engage with each aspect of the study, but most of the work is done by small, focused workgroups. As described in Section 0, SVP organizes participants in ***Circles of Influence*** (COI). The easiest way to create the COI framework is to rely on existing social or institutional structures. For example, if there is an existing relevant environmental working group, ask if they can form an environmental task group for your study. Similarly, instead of organizing traditional public meetings to reach out to Circle C, target existing groups and their meetings. For example, there is a sport fishing club in Smallville that is identified as part of Circle C. Members of Circles A & B could attend some of their meetings to present information about the SVP process and to collect input that could be helpful to the workgroups and decision-makers.

The Collaborative Modeling Process

This section highlights three aspects of the collaborative modeling process: (1) Planning and conducting meetings with participants, (2) Collaboratively developing the model, and (3) Identifying preferred options and/or making decisions.

Meetings and workshops

In the first meeting with stakeholders, your primary objectives are ***to inform*** the stakeholders about your study and the SVP process, and ***to listen*** to the stakeholders and continue to gather information from them. Be sure to clarify (and reiterate in subsequent meetings) the expectations of the process. Who has the power to make decisions, and how much influence will this process have on future policy? Outline what the Corps can and cannot implement, and what others can. Tell everyone how this collaborative process will inform decision-making, and particularly, the limitations of the process. For example, can the Corps build a new water supply reservoir on the Blue? No, but the collaborative process – informed by Corps and State regulatory requirements – should make it easier for Centreville to implement a solution to meet its water supply needs. Will the Corps be able to fully fund a project that maximizes local economic development? Probably not – the Corps has its rules and that means it probably can only fund a portion – you'll need to check on current cost-sharing policies. Will the Corps District Engineer cede his/her decision authority to this process? No, he/she probably can't, legally. Instead, you need to ensure that everyone understands the criteria that legally bind the various parties and to work collectively to develop feasible alternatives. If you can achieve that, you will be in good shape with the district commander and other leaders.

You need to listen to the stakeholders to find out their understanding of the hydrologic (or economic, or ecologic...) system, their concerns, and their ideas about causes and solutions of problems. What policies is the community already discussing to prevent future water shortages? Are there existing land use policies that affect future development?

As participants share their ideas for solutions, conflicts may arise. These conflicts may be a result of false information about how the physical system works, or they may be caused by differences in values or interests. Actively engaging the participants in model development leads them to testing their assumptions and helps to reduce conflicts based on misinformation. As an example from our case study, the local fish biologist is concerned about the salmon population and would like to see limits placed on recreational fishing. The mayor of Smallville, however, is thrilled by the economic revenue gained by visitors coming through town to recreate and would like to see their bountiful resources promoted widely. At the same time, the environmentalists are concerned that the dam significantly disrupts the natural pattern of flows, and believe that the ecosystem (including the wetlands) would be better off if the dam was removed. A number of residents living close to the river bank disagree, however, as the dam is there to protect them and water in their basements is unacceptable. These conflicts are typical, but don't get discouraged. Frequently, stakeholders begin the SVP process thinking narrowly – only about the aspects of the system that affect them or their issue, and they often have solutions already determined. Through the open communication and modeling, the stakeholders will broaden their perspectives of the Blue River Watershed. Development of the model will steer the conversation away from alternatives (initially) and toward jointly describing how the system has been working and how it may work in the future.

Model development and use

When you first meet with the stakeholders, they will likely not understand what you mean by developing a model, so you need to help them to visualize the kind of model they will help to develop. You can do this by either showing a completed model created for another case study, or by developing a preliminary model for the current case study. If you develop a preliminary model, keep it simple, but make the assumptions and data transparent. At this point, the model does ***not*** represent a shared vision of the system. After you get buy-in – to the modeling process, to the data, to the relationships, to the performance measures – only then is it a ***shared vision*** of the system. Not only will the model help to make the SVP process tangible, it will also serve as a starting point for discussion about what the problems and opportunities really are.

You may be wondering what the computer model adds to the negotiation of the watershed plan. As an example, consider what issues are relevant to determining how to best operate flows at Blue River Dam. The fish biologist wants to ensure that river flows are sufficient during the late summer migration and spawning season but also knows that salmon lay eggs along the river banks in the spring. Flows must remain relatively stable for six weeks after the eggs are laid – too low and the eggs will dry out – too high and the banks will scour and wash the eggs away. Also in the spring are flood control issues - to prepare for spring snowmelt, the reservoir must be lowered by the end of March. The water supply manager of Centreville, however, hates to see this water "wasted," because supplies in the summer are often too low – watering restrictions have been imposed for the last three of five years. Furthermore, a climatologist from the local university just reported that climatic changes could change the timing and magnitude of annual

precipitation and the spring melt. Do you see a clear picture and solution yet? Our mental capacity to integrate several pieces of information is quite limited, especially when we are dealing with changes through the year and into the future. The computer model is a tool to help us to keep track of all of these pieces of information. It also helps us to test and communicate our assumptions about how these pieces are related and what happens when the pieces work together. Even relatively simple systems can become complex when there are multiple issues and parties with different concerns. SVP can help to manage this complexity.

Through collaborative modeling, the participants describe and quantify key relationships so that everyone sees their conception of reality represented in the model. Objectives and performance criteria can also be documented directly in the model through the use of text boxes. As their ideas are captured, all the participants will take ownership of the description and will be more likely to trust the model's output. By having a transparent model that can be easily modified to incorporate their concerns right then and there at the workshops, the participants will start to (a) get an idea of how different groups' objective and interests are related and (b) see that you respect their ideas, knowledge and objectives.

To tackle the issues, members of Circle B can be organized into teams according to their expertise or interest. For the Blue River example, you might assemble teams for hydrology/hydraulics, flood risk, recreation and tourism, and aquatic biology. These teams will investigate the issues and assemble data to the extent necessary to capture their issues into the model. Workshops provide opportunity for these groups to communicate with one another. Groups can learn from others as well as question each others' assumptions, serving as a quality control check.

Circles B, C and D do not need to worry about learning a programming language. Circle A members provide the modeling expertise and do the coding. The model should be made transparent, as shown in the example (Figure 3), so that members of Circles B, C, and D can follow the logic, assumptions, and limitations. It should also be integrative, user-friendly and flexible. These characteristics support stakeholder interaction with the model as well as brainstorming and negotiation. The flexibility ensures that the model can be continually modified to remain up-to-date as new information becomes available through the working groups and through dialogue.

Through this structure of collaboration and teamwork, combined with an open process and transparent model, you can see how SVP doesn't just allow stakeholders to contribute to the project, but makes them members of the team. This new relationship and the shared responsibility help to build trust between you and the stakeholders, as well as between the various parties. Thus SVP provides a means of overcoming the lack of trust present in many cases. This trust-building is a critical prerequisite for moving to the decision-making stage and for cooperating to find mutually beneficial (or mutually acceptable) solutions.

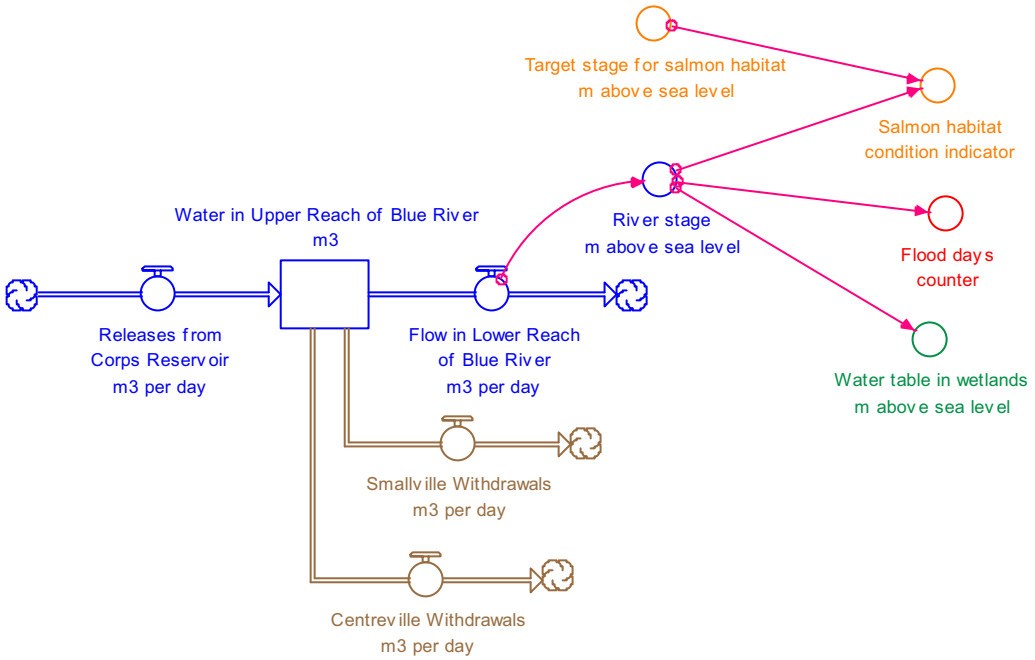

Figure 3: A model of the Blue River Watershed

Formulating and Evaluating Alternatives

Once a shared vision of the system has been established and everyone agrees on the model, the process is ready to shift to focus on alternatives. New alternatives may be generated and evaluated. Then, the group can discuss tradeoffs and preferred alternatives. The explicit state indicators and their target ranges (examples from our case study include the number of days of flooding, salmon spawning habitat condition, and elevation of the watertable in the wetlands) help to illustrate when alternatives are or are not meeting objectives. Because those that may be hurt might block an agreement, the transparent display of outcomes encourages winners to work collaboratively to find ways to address the concerns of the possible losers.

During the modeling process, participants clarify their understanding of the system and gain an appreciation of others' values and interests. During the decision-making stages, this learning continues, but now the participants have the chance to reflect and clarify their own values and interests. For example, the homeowner who lives along the Blue River is still adamant that no amount of flooding is acceptable. At present, the way to reduce flood risk is to draw down the reservoir in the early spring. However, if the spring freshet does not refill the reservoir to the target level, there will be an increased risk of water supply shortages, as well as a decreased ability to meet ecosystem flow targets. Through discussions and using the model, this tradeoff becomes obvious to the homeowner. So, does he still feel that zero flood risk is the only acceptable answer, or is water supply for the rest of the town just as – or more – important? Perhaps alternate solutions could help, such as building a flood wall, or reducing residential water use through xeriscaping, low-flow fixtures, and other demand management measures. Being

confronted with actual tradeoffs forces participants to reflect on their true values and envision what they want for their community's future. The respect for their neighbors encourages creativity in finding new, mutually beneficial solutions.

Implementing the Plan

The final two steps of SVP are critical for extending the benefits achieved in the workshops to implementing changes in management or policy in the system. SVP is not unique in asserting that negotiated solutions have to be implemented, but the characteristics of a good SVP study (particularly COI and the collaborative model) serve to make implementation more likely and more effective. The COI structure ensures that the decision implementers (Circle D) are involved throughout the study. Thus, they contribute their ideas and views, and have the opportunity to see how stakeholder objectives and issues of risk and uncertainty have been accounted for. The shared vision model serves as an invaluable tool to help answer questions that come up during the implementation stage.

Additional preparation that aids in the implementation stage is the use of "practice decisions." These sessions can be held periodically during the model development stage and encourage the decision makers and all other parties to ask the necessary questions required for implementation. Raising these issues early ensures that time is available to address them. In addition, these practice decisions also help to:

- Clarify and quantify decision criteria
- Ensure studies can address these new questions (through adjusting existing studies or launching new studies)
- Clarify and confirm the nature of the decision (ie, Is the goal to recommend a single plan or several options to the decision maker?)

Environmental conditions and human values are not static, so plans should also not remain static. One form of adaptive management includes regular review of conditions and plans to evaluate (1) if the expected results are being realized, and (2) if the plan is still the most appropriate for the existing conditions. At the end of the workshop series, a strategy should be determined for maintaining the new project or plan. Will there be regular monitoring? Should the team reconvene annually to reassess the plan? Adaptive management provides the critical feedback and course correction that is necessary in a complex, changing world and can increase the success of resource management.

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5. SUMMARY

Water resources planning and management has become more complex with increasing, competing demands. Among stakeholders, who are now a critical part of resource management, there may be conflict surrounding the facts and preferences. Complicating matters, their knowledge may be limited and their preferences uncertain. They may lack trust in government and authority. Shared Vision Planning, which combines traditional water resources planning, collaborative modeling, and stakeholder participation, provides a means for managing these challenges.

SVP helps to manage the complexity through the support of a computer model. Systems models are able to combine hydrologic aspects of the system with economics as well as less tangible issues such as flood risk and ecosystem habitat.

SVP can reduce knowledge-based conflict and clarify value- and interest-based conflict, making them more manageable. The construction of the model provides a common language to describe the system, forces parties to reveal assumptions so that differences can be reconciled. Frequently, at the beginning of the process, stakeholders think narrowly about the problem, based on their limited personal roles and experiences. By bringing these stakeholders together at meetings and through the open dialogue, stakeholders may begin to respect other perspectives. The model serves as a focal point for discussions, and in doing so, makes discussions slightly less personal, while keeping preferences explicit. Everyone is thus encouraged to find solutions to which all parties can agree.

Stakeholders who participate in SVP have the opportunity to clarify their knowledge as well as their preferences. As mentioned, the modeling process is a tool for reconciling differences and developing a shared vision of how the system has and will behave. Being confronted with tradeoffs forces participants to reflect on their true values and envision what they want for their community's future.

Lack of trust in authority among stakeholders can cause opposition during the standard method of involving the public only for document review and may raise hostility if plans move forward. The alternative that SVP advocates is to involve stakeholders throughout the planning process. This prevents surprises and ensures that their interests and values are incorporated. The stakeholders work in partnership with the lead agency rather than as recipients of their efforts. Through the teamwork, stakeholders ideally develop trust in the lead agency and decision-makers.

This approach may appear to be more resource intensive; however, the upfront investment of time and money is returned several-fold.

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6. RESOURCES

Document References

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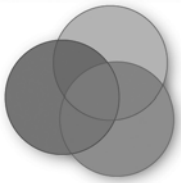
Werick, W.J. and W. Whipple, Jr. 1994. Managing Water for Drought. National Study of Water Management During Drought. IWR Report 94-NDS-8. U.S. Army Corps of Engineers.

Additional Information

The Shared Vision Planning Website:
www.SharedVisionPlanning.us



Shared Vision Planning

The History of Shared Vision Planning

The Shared Vision Planning approach began in response to the U.S. Army Corps of Engineers need to revise water management strategies on the Potomac River in the late 1970s. The Interstate Commission on the Potomac River Basin made public participation a key feature of its planning process to more effectively manage water supplies in the D.C. metro area.

In 1988, in response to severe droughts across the United States, the Corps undertook the National Study of Water Management During Drought (known as the National Drought Study) to examine and improve water management practices nationwide. The method developed in this project's case studies evolved into the planning approach now known as Shared Vision Planning. The "Drought Preparedness Method," as it was named during the National Drought Study, emphasized preparedness, stakeholder involvement, and the use of collaboratively developed computer models, which remain the core aspects of Shared Vision Planning today.

Shared Vision Planning and its particular method have been applied to a number of case studies since the National Drought Study, thereby refining the process and increasing Corps scientists' familiarity with it. The Lake Ontario-St. Lawrence River Study, the James River Basin Study, and the Rappahannock River Basin Commission Water Supply Planning Project are just a few of the projects that have benefited from the Corps use of Shared Vision Planning.

To further explain the concept and method of Shared Vision Planning, and educate the wider resources planning community, IWR has created a new Shared Vision Planning web site. We invite you to visit the site at http://www.sharedvisionplanning.us to learn more about this collaborative planning approach.

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