The What and Why of Shared Vision Planning for Water Supply*

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Introduction

There is an old saying frequently attributed to Mark Twain: "Whiskey is for drinking. Water is for fighting over." Given that this adage is at least 100 years old indicates that conflict over how to use our water resources has never really been in short supply. Conflict and "fight'n" over water seems inevitable. But is there a way to manage and channel this conflict in ways that will lead to more productive, inclusive, and mutually satisfactory outcomes?

Shared vision planning is an approach to managing this conflict in a way that can increase the chances for reaching constructive agreements. Shared vision planning relies on deliberative, inclusive decision making processes as the forum in which to debate how water resources will be used among competing ends. What is unique about shared vision planning, however, is how analytical technical expertise and analysis is integrated into a collaborative planning process. Through a structured planning process, an analytical computer model of the water resource system, called a shared vision model, is constructed with the participation of stakeholders. The shared vision model is designed to be used by stakeholders themselves to develop a mutually satisfactory water supply plan.

Conflict in Water Supply Planning

As Bill Lord (1979) pointed out many years ago, conflict in water resources planning arises over answers to two basic types of questions: "What is?" and "What ought to be?"

First, conflict can occur over answers to "What is?" questions. Water supply planning requires that we answer questions about how the water supply system works -- if "A" happens, what will happen to "B"? Examples of this type of "What is" question in water supply planning might include:

- What is instream flow if we operate a reservoir this way?
- What is per capita water consumption under this conservation program?
- What is the risk of a water shortage in the next 10 years?

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Participants in a water supply planning process may disagree over the answers to these questions. Lord (1979) calls these technical debates "cognitive" conflict. Better knowledge and more sophisticated technical analysis can reduce this type of conflict. Resolving or managing cognitive conflict is challenging, given the complexity of our natural and social systems and the forward-looking nature of the planning process (what is and will be). After all, technical analysis of existing technologies and water use behaviors can better inform, but rarely provide a definitive answer to, what per capita water consumption is likely to be in the future.

The challenges to answering "What is" questions, however, pale in comparison to the challenge of answering questions of "What ought to be?" Examples of "ought" questions that typically arise in a water supply planning process are:

- What water supply risks ought the public assume?
- What water conservation measures ought the public be required to do?
- What ought to be minimum instream flows?

Answers over ought questions do not have a technical solution, but are primarily social and political in nature -- rooted in deeply held interests and values of the different players in the planning process. Several types of conflict arise over questions of what ought to be done. One type of conflict is "interest conflict". Interest conflict is personal in nature – related to how an alternative will personally influence private stakeholder interests (Lord 1979). For example, a proposed water supply project of one local community may reduce future water supply of a downstream community. In this case the water supply decisions have a direct impact on the economic well-being of a downstream community. Other types of conflict are more ideological in nature. Value conflict is more communal in nature and arises over different opinions of what is good for *us* as a community or society rather than what is good for me individually (Lord 1979). "Value" conflict can be more abstract and subjective than interest conflict and often centers on the relative importance of environmental quality versus economic growth or consumer sovereignty. Much environmental conflict, such as that surrounding instream flows, is, at its origin, value conflict. Participants in water supply planning may all agree that "A" water supply plan will have "B" impact on instream flow. Furthermore, few may have a direct personal stake in changes in flow regimes (one's self interest is not directly impacted by stream flow levels). Nonetheless, conflict over what ought to be a minimum instream flow can be acute. The conflict often arises from environmental ethics related to the degree to which human water use will impinge on the aquatic ecosystem.

Given this social and political origin, technical analysis cannot resolve value or interest conflict. Technical analysis cannot answer what ought to be done and how much water ought to be left in the stream channel. But technical analysis is necessary to illuminate and foster creative debate and resolutions over ought questions.

Unfortunately, our current water supply planning processes are not doing a very good job at dealing with these conflicts. The situation we often find ourselves in now is a highly pitched political battle over value and interests that is being waged with technical analysis. The aim is not to learn from the opposing side, but to score political points and tactical advantage through analytical maneuvers. Technical analysis is more often used to defend, attack, or legitimate firmly entrenched positions, rather than reducing cognitive conflict or reconciling value and interest conflict.

Planning is made more difficult when we allow the decision process to confuse "is" and "ought"; When we allow technical analyses of the "is" to obscure appropriate debate about the "ought"; when we allow interests and value conflicts to be shrouded by an impenetrable fog of technical analyses.

Helen Ingram and Anne Schneider (1999, 27) , recently wrote "The most fundamental flaw in contemporary water policy is that many value questions in which ordinary citizens have a great interest are being framed as technical questions."

Shared Vision Planning and Models

Shared vision planning (SVP) is an approach to water supply planning specifically designed to address the type of problem expressed by Ingram and Schneider. The essence of shared vision planning is to create a planning process capable of building a mutual understanding of the "is" questions for the ultimate purpose of focusing decision-participants' attention, debate, and resolution on the "ought" questions.

Various versions of the shared vision theme to planning are around, but the SVP vision was articulated by the U.S. Corp of Engineers' Institute for Water Resources (IWR) in its 1995 *National Study of Water Management During Drought*. Using methods pioneered by Richard Palmer and refined, tested and studied by the staff at IWR, the *Drought Study* contained example applications of how "shared vision planning" could be designed and used to resolve water conflicts.

Shared vision planning is built on three separate foundations: planning principles, collaborative negotiation, and technical system models.

1. SVP relies on time tested planning principles – identify objectives, formulate alternatives, measure effects, evaluate alternatives - to structure a water resource planning process.

2. SVP relies on collaborative negotiation between different stakeholder groups, rather than technical experts, to apply these planning principles. SVP expects that a deliberative decision process be used to develop objectives, formulate alternatives and produce ways to evaluate alternatives with the ultimate purpose of building agreement on what *ought to* be done. Advocates believe that public collaborative negotiation, properly structured, can be a transformative process and not simply a way of dividing up known gains and losses. Collaborative negotiation can help shape preferences of the participants through mutual understanding and discovery of each others'

interests and values, which can lead to the collaborative development of creative alternatives. The idea behind collaborative negotiation is to structure a decision process that is best capable of jointly expanding opportunities for discovering mutually beneficial gains. The idea is not to set up a battle over a fixed pie, but rather to encourage people to find a bigger pie.

3. Decision-participants cannot decide what ought to be done without first having a basis for knowing "what is." SVP relies on systems engineering and computer modeling to identify how the multiple elements in a water resource system relate to one another. Computer models used in shared vision planning are called "shared vision models" (SVM). SVMs help planning participants answer "what is" questions: If A happens, what will happen to B. The model does *not* pretend to make judgments on what ought to happen -- what is the best plan or whether "B" is good or bad, desirable or undesirable.

The shared vision approach plays a key role in linking the three foundations of shared vision planning together. The unique aspect of SVP is that the technical shared vision model is built within a collaborative planning process, not as an outside add-on to it. An SVM is built by the stakeholders themselves, with the assistance of technical analysts. The process of collectively building an SVM facilitates mutual learning by the decision participants about important dynamics and relationships of the water resources system. The process of designing SVM builds confidence in all stakeholder groups in their analytical capacity to answer "what is" questions. Building a collective understanding of "what is", however, is only a means to achieve the ultimate goal: negotiation and resolution among stakeholders about "what ought" to be done.

With the assistance of technical analysts, stakeholders help design the model to address the objectives that are important to them and to provide information they need to assist in the formation and evaluation of alternatives. Stakeholders help analysts identify key components in the water resources system and how these components are related to each other (water intakes, water supply reservoir operation, sources of water demand, recreational uses, aquatic resources, etc). The stakeholders share information about each of the components. If the participants in the planning process believe the model is capable of answering is questions and believe the model sheds light on the values and interests that are important to them, the SVM can provide a forum for debate, and a better opportunity to discover, a plan that everyone can agree on.

In order for planning participants to collectively construct a shared vision model, computer software must be both technically powerful enough to capture the complexities of the physical system, but also capable of being verified, used and manipulated by those without formal mathematical or technical computer training. The key characteristics of shared vision modeling software are ***flexibility***, ***transparency***, and ***ease of use***. Shared vision models need to be flexible, transparent, and easy to use, not for the technicians, but for the planning participants themselves.[1]

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[1] For example, the computer software program called *Stella* contains many of these characteristics and is often used to construct shared vision models. Stella is an object oriented program that allows the program designer to "draw"

A shared vision model with these characteristics accomplishes the following:

- Permits planning participants to see and understand the causal relationships in the system: If A then B. For example, decision participants will be able to trace the causal relationship between per capita water use (A) and downstream flow (B). In conventional technical analysis, these relationships are embedded in a complex computer code. A shared vision model displays these relationships in ways that stakeholders easily understand, visualize, and verify.

- Relies on stakeholders in the planning and negotiation process to help produce and verify technically credible estimates of, and the functional relationships between, A and B. What is per capita water use? What percentage of water use is returned to the river as return flow? These are questions that the participants themselves help articulate and answer with the assistance of technical analysts. SVM recognizes that not all knowledge is held by experts and that understanding and articulation of these functional relationships can be improved by people with a rich variety of on-the-ground experience and knowledge.

The ability to see and articulate relationships in the system facilitates joint learning and expands understanding of how the system works for all involved stakeholders. The model building process provides a way to identify and address cognitive conflict and builds confidence that the model can answer "what is" type questions. Confidence is built because the relationships and components of the system are transparent and equally accessible to everyone involved in the planning process.

SVM aims to build confidence to answer "what is" questions with the ultimate purpose of facilitating discussion of the "ought" questions. The characteristics of an SVM focuses attention on "ought" questions in the following ways:

- An SVM allows stakeholders, themselves, to actively manipulate the values and relationships between A and B. If stakeholders personally want to change per change per capita water use from 70 gallons per day to 60 gallons per day, they can. The stakeholder themselves can run the computer model with the new value and examine how such a change impacts downstream flow or the operation of water supply system. Point and click computer menus can make such changes easy.

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the relationships within the program. For example, water withdrawal from a river (A), diverted to households (B) and then a portion returned to the river as waste water (C). Stella represents the relationship between A, B, and C as a visual set of "flows".   Accompanying this visual display are specific mathematical or graphical relationship between A, B, and C. For example the amount of water returned to the river (C) could be a mathematical expression like C = B * PERCENT WASTEWATER. The PERCENT WASTEWATER is simply the percentage of water households returned to the river via a centralized sewer system. Stella would also allow users to construct computer control panels that would allow them to change the value of PERCENT WASTEWATER.

The capacity to change key conditions in the model allows stakeholders to jointly investigate virtual "what-if" situations. For example, virtual drought simulations can be used by stakeholders to explore the severity of drought and alternatives to mitigate drought. Stakeholders can use this flexibility and ease of use to investigate the effectiveness of different drought management alternatives and examine the circumstances that make alternatives less effective or desirable. This flexibility would allow stakeholder to assess whether a drought curtailment plan that reduced per capita water consumption from 70 to 60 gallons per day would be able to meet the water supply and stream flow objectives.

- Perhaps most importantly, though, the SVM is flexible enough for users to add and modify elements of the program to reflect their own objectives. A group of stakeholders might believe and accept the relationship between "A" and "B". For example everyone might agree about the relationship between per capita water use (A) and downstream flow (B). But stakeholders might view "B" as only an intermediate step to an end state that more directly concerns them, "C". Downstream flow, for example, may only be of interest in the way it influences the composition of fish species. A shared vision model would allow users to add streamflow-fish response relationship, if this is needed to facilitate the negotiation process.

This flexibility allows the technical analysis to accommodate new and emerging concerns of the planning participants that are likely to emerge through a group learning and negotiation process. This flexibility is important because a deliberative process means that participant objectives, knowledge and experiences will evolve and change over time with the discovery process and the technical analysis must be able to handle and accommodate emerging concerns and issues. The flexible and transparent nature of the model also *requires* participants to be explicit about their knowledge, objectives, interests, and values. If the ultimate interests and objectives of the participants are transparently built in the model, it becomes clear to everyone how different water supply alternatives do or do not meet these objectives.

Conclusion

A shared vision planning process puts the burden on the stakeholders themselves, rather than technical experts or rigid regulatory dictates, to identify the answers to what can be done and ought to be done. And, the shared vision model gives them the tools to structure and facilitate the debate over the best way forward. SVP does not promise to eliminate conflict. The shared vision process may not always produce agreement. After all, some stakeholders may elect to negotiate in bad faith or to purposefully undermine the process. Any deliberative planning process will fail under these circumstances. But SVP does aim to improve the prospects that people with different interests and values can discover enough common ground to identify mutually satisfactory alternatives through a negotiated planning process.

References:

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