

Stakeholder engagement for sustainable water supply management: what does the future hold?

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ABSTRACT

Sustainable water supply and water resource management relies on effectively engaging stakeholders in decision making. With water conflicts increasing due to stressors such as population growth, climate change, and aging infrastructure, stakeholder engagement holds the promise to improve decisions, save time and money, and improve relationships between governing bodies and stakeholders. This opinion paper reviews the benefits of engaging stakeholders in water supply management decision-making, assesses the current state of the practice, and predicts future trends in the North American setting. The current use of technology will undoubtedly continue, allowing water managers to engage more stakeholders and engage them more substantively. We predict increased roles for the private and nongovernmental sectors in stakeholder engagement, taking place at different scales, but with a focus on the local level. Evaluating the benefits and effectiveness of engagement processes will help justify the investments, and also support practitioners to determine the most appropriate tools and techniques. Finally, foundational principles of open communication, building and maintaining trust, and ethical decision-making must be placed front and center. We see continued growth in the importance, tools, and application of stakeholder engagement as water managers and the communities they serve to strive towards sustainability.

Key words: decision-making, public participation, stakeholder engagement, sustainability, trust, water management

HIGHLIGHTS

- Sustainable water management increasingly relies on effective stakeholder engagement.
- Over the last 50 years, stakeholder engagement has become a standard part of water supply management, with well-established best practices.
- Over the next 50 years, stakeholder engagement will remain critical and need to stay grounded in the foundational principles, be adaptable, and focused at the local level.

1. INTRODUCTION: WHY INVOLVE STAKEHOLDERS IN DECISIONS ABOUT WATER?

An example of how things can go terribly wrong without open and transparent communication among all stakeholders happened in the city of Flint, Michigan, United States (U.S.). The city switched water sources in April 2014 in a decision that only one party made, motivated by saving costs. It is clear by the tragic aftermath that neither human health risks nor technologies to deliver safe water were factored into that decision or its execution. Appropriate coordination among all responsible and affected parties would have ensured these factors were weighed and managed, which could have changed the course of events. Consequences included 12 deaths from Legionnaires' disease, elevated levels of lead in children, *E. coli* in the water, and impacts to local industry. Furthermore, there was racial disparity among those most impacted. Lawsuits were drawn against responsible parties. The community's trust in their government to protect them was lost, and continued to erode when their safety concerns about the water went ignored (Butler *et al.* 2016; Davis *et al.* 2016; NRDC 2020).

Stakeholders should play a role in major water supply and resource management decisions because water is a public good that directly affects their lives and their community. Decisions about water need to reflect that community's values. On the

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global scale, often the prioritization of cost savings and belief that persistent growth is essential dominates water management decisions, to the detriment of under-represented stakeholders and nonhuman beings (Strang 2021).

In the United States, laws require public participation in environmental decision-making. Up to the middle of the 20th century, decisions were largely entrusted to technical experts and political leaders. However, by the 1960s, the decisions that favored economic development clashed with stakeholder desires to protect human and environmental health. New technologies had devastating consequences, such as DDT pesticides decimating bird populations and industrial waste destroying aquatic habitats. After a series of environmental disasters eroded trust, the public demanded to be involved in decisions that affected them. Around 1970, several laws were enacted that required involving the public in environmental decisions (National Environmental Policy Act – 1969; Clean Water Act 1972). At this stage, early conveners learned by trial and error what worked – and what did not.

Since it was first established about 50 years ago, the field of Public Participation/Stakeholder Engagement has made tremendous strides, advancing practices with the many lessons learned along the way. Early efforts to engage the public often floundered. There was considerable confusion as to what role stakeholders could play or how they could contribute in a meaningful way. In the early 1970s, the U.S. Army Corps of Engineers encouraged their staff to translate the technical language for the general audience and to fully inform them so they can participate effectively (Galloway 1974). Without the knowledge and skills to engage stakeholders in a meaningful way, many technical experts used public meetings to announce decisions that they already made (nicknamed the ‘DAD’ method of public participation: Decide-Announce-Defend).

Thankfully, today facilitators of stakeholder engagement benefit from five decades of experience, lessons learned, as well as tools and techniques. Now, there is an established profession and community of practice with established standards. Organizations such as the International Association for Public Participation (IAP2; founded in 1990), the International Association of Facilitators (IAF; formed in 1994), and the Association for Conflict Resolution (formed in 2001), provide training to assist practitioners to use the practices that have been found to be most effective with decades of experience (IAF 2020; IAP2 2020).

In this article, we introduce stakeholder engagement and explore the current state of the art as applied to water supply and water resources decision-making, highlighting its potential role in the path to sustainable water management. Then, we look at emerging trends and comment on what we expect for the role of stakeholder engagement in the future.

1.1. What is stakeholder engagement?

Stakeholders are those who may affect, be affected by, or can influence a decision or process. *Stakeholders* may include national, regional, and local governing entities, tribes (First Nations; Aboriginal people) private sector corporations, academic institutions, faith-based organizations, nongovernmental organizations (NGOs), and other civil society actors, as well as communities and individual citizens. Stakeholder Engagement is rooted in the foundations of open communication, trust-building, and ethical decision-making. Stakeholder Engagement varies widely in format, from ongoing interagency partnerships to specific problem-solving initiatives to mediated frameworks for third-party alternative dispute resolution (ADR). It can employ a range of ‘technologies’ from traditional face-to-face meetings with sticky notes, to videoconferencing and collaborative geospatial platforms.

Several terms are synonymous with Stakeholder Engagement. Public Participation is the term preferred by the International Association for Public Participation (IAP2), defining public as any entity outside the convening entity, and engaging them in any way. Public Involvement and Collaboration are also sometimes used for the same broad meaning. However, *involve* and *collaborate* also have specific meanings on the IAP2 spectrum (Figure 1).

1.2. Why engage stakeholders?

Engaging stakeholders according to established best practices has the potential to realize numerous benefits. Benefits can be realized during the process, as an intermediate outcome, or a longer-term resource management outcome (Carr *et al.* 2012). Process-related benefits are easier to measure; however, intended outcomes are often the focus and justify the investment. Here, we begin with some immediate benefits of stakeholder engagement.

1.2.1. Manage and transform conflict

While most people view conflict as undesirable, conflict is a normal, inevitable part of life. In fact, when managed well, the presence of conflict can provide a transformative opportunity to envision new alternatives that benefit all (or most) stakeholders and build mutual understanding. Conflict comes from several sources – data, interest, value, structure, and relationship (Moore 2003). Effective stakeholder engagement has the potential to address all five of these conflict types by

IAP2 Spectrum of Public Participation

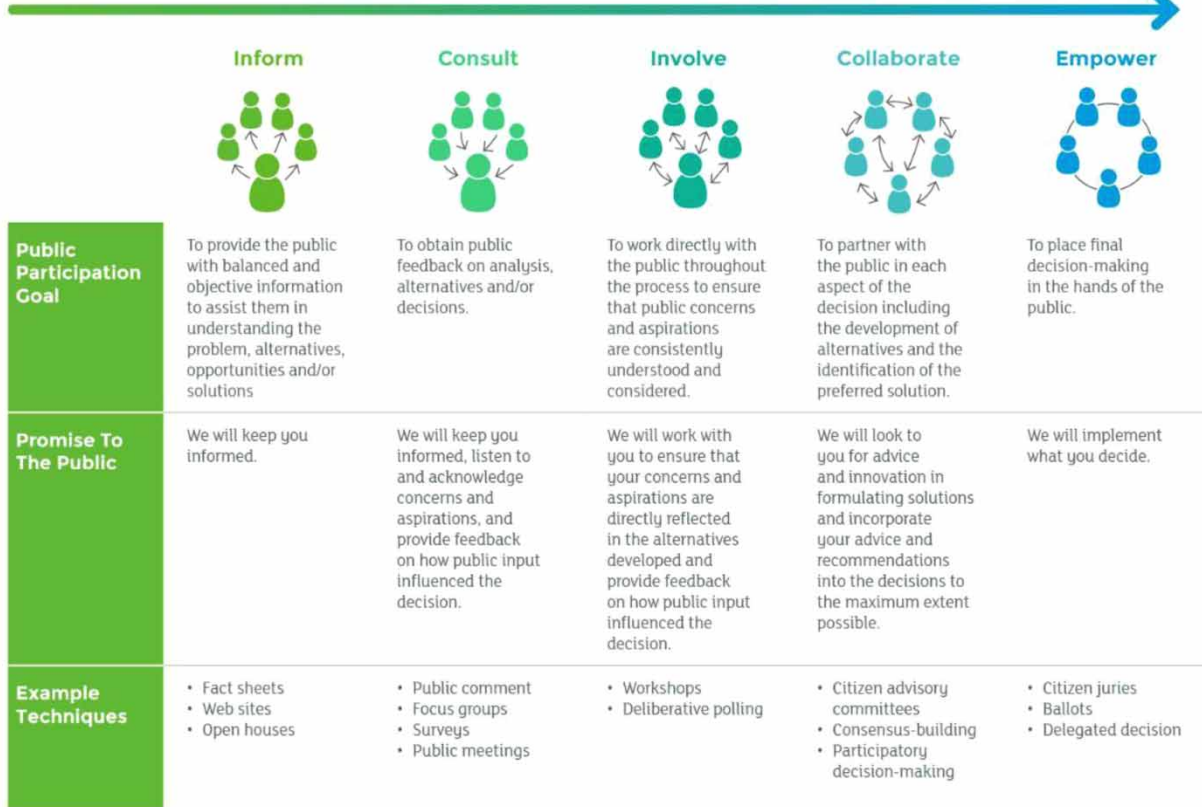


Figure 1 | IAP2 Spectrum of Public Participation as presented by Patient Voices Network (2020). Many other organizations have adopted similar spectrums of engagement.

providing a safe, structured environment that fosters trust, openness, and mutual respect. Participants expand their awareness from their limited view to the entire system by exchanging knowledge, values, and interests, and by clarifying false assumptions and correcting misinformation. For example, engaging stakeholders can address data conflicts by allowing everyone to contribute their knowledge, testing poor assumptions, and correcting misinformation. Relationship conflicts may be diminished by bringing people together and facilitating shared problem solving. Additionally, stakeholder engagement fosters shared understanding about the whole complex system and encourages all participants to share their interests and values, both of which can increase empathy among all involved. This, in turn, can increase willingness to work together to find mutually beneficial solutions (common ground), or to compromise when necessary if it serves a greater good (realizes more benefits to more stakeholders).

1.2.2. Values conflicts and water management

How to use or control water is not just a technical decision, but a decision that is based on *values*. What *should* be the allocation between water for a city and water for the ecosystem? What are *acceptable* levels of contaminants? Since water is a public good, this decision should not be left to technical experts. Rather, stakeholders should have the opportunity to voice their value preferences on how the water is used to support their community, so that resources are managed for the maximum benefit to all. A leader in water management in the U.S., William Lord observed, ‘Bad water management often occurs when facts are confused with values, when means are confused with ends, and when technical judgments are made by citizens and politicians while value judgments are made by scientists and professionals’ (Lord 1984).

Values conflicts are the most challenging to reconcile, but also provide opportunity. Since values are normally hidden, stakeholders who clarify and share them explicitly can then work together to find areas of agreement. Since decisions about water allocation and use should reflect the values of the whole community, this necessitates well-designed and executed

stakeholder engagement. As resources become constrained with the combination of climate changes and population growth, and as the access to communication channels has the potential to amplify the voices of those who use them, it becomes even more critical to have an intentional process with balanced representation and an opportunity to hear from all perspectives, and to ensure that citizens, elected officials, and technical experts all participate appropriately in the decision.

1.3. What are the intermediate and longer-term benefits of stakeholder engagement?

Effective Stakeholder Engagement processes, in resolving conflict and advancing the process, on average experience three types of long-term benefits in comparison with not engaging stakeholders: (1) Better outcomes; (2) Improved governance; and (3) Cost savings (Federal 2018).

1.3.1. Better outcomes

By weighing all participants' values in the decision, resulting decisions reflect the aggregate of stakeholder values and preferences for water use and management. Evaluation by the Federal Forum (2018) of 52 cases that used environmental collaboration and conflict resolution practices showed 82% of cases reached consensus. Furthermore, consensus correlated significantly with having the appropriate parties involved and effective engagement of participants. These two factors, as well as using high quality and trusted information in the process, also positively correlated to durability of the agreement (Federal Forum 2018). Similarly, Duram & Brown (1999) evaluated 64 federal watershed planning initiatives and found 58.5% of respondents perceived participation to have had a positive impact on reaching consensus on goals and plans. Beierle & Konisky (2000), in a meta-analysis of participation programs in the North American Great Lakes, found that conflict between interests decreased in 11 out of 19 cases. Reduced conflict not only supports better decisions but also improves relationships.

1.3.2. Improved relationships and governance

Effective stakeholder engagement enables mutual education of all stakeholders, including experts and government agencies, through the integration of local knowledge, community values, and technical knowledge. It engenders higher levels of trust and credibility, increased community and government capacity, and stakeholder and citizen responsibility and ownership of solutions. The latter improves implementation and durability of decisions, as engaged and motivated stakeholders are far more likely to support a project emotionally and politically, and much more willing to fund the ongoing monitoring and maintenance of installations. For example, Newig & Fritsch (2009) found that for 47 cases across North America and Western Europe, public participation raised the acceptance of environmental decisions and led to compliance and more rapid implementation.

Engaged and knowledgeable stakeholders also improve resilience to stressors. As water supply conditions change with climate change, population growth and aging infrastructure, stakeholders may be empowered to respond quickly. In some contexts, it is valuable for the immediate community, who has the closest connection to the water resource conditions, to be able to respond rather than relying on a large governmental body who may not be able to prioritize or respond quickly.

1.3.3. Cost savings

Although it takes an investment of resources to engage stakeholders, studies have shown that time and money is saved over the life of the project or process. Coordination and collaboration can coordinate efforts, leverage multiple funding sources, maximize expertise, eliminate duplication of efforts, and reduce litigation. Stakeholder engagement is highly effective at mitigating conflict and breaking through gridlock. Compared with litigation, collaborative processes such as ADR offer substantial savings in time and money. In 2015, the U.S. Environmental Protection Agency (USEPA) found that engaging stakeholders in collaboration and conflict resolution processes required 45% fewer weeks to reach a decision, 30% fewer staff members, and 79% fewer lead attorney hours. Furthermore, a detailed review of collaboration and conflict resolution cases by USEPA and the U.S. Department of Interior found an average of USD 50,000 worth of staff time was saved in comparison to litigated cases (Hall 2016).

2. STAKEHOLDER ENGAGEMENT TODAY AND TOMORROW: A SWOT ANALYSIS

We reflect on the current state of stakeholder engagement for water management as well as future opportunities, using the format of a SWOT Analysis (Strengths, Weaknesses, Opportunities, Threats). We offer perspectives on the internal strengths and weaknesses of current practices, and then consider external factors for opportunities for new or more effective engagement, and the threats or challenges that professionals are facing currently or anticipate facing in the future.

2.1. Strengths in the practice of stakeholder engagement

The strengths of the profession are the key best practices, general tools to support stakeholders in decision processes, and the relationships and norms that have been established over the last 50 years.

2.1.1. Tool: public participation spectrum of engagement

Arnstein (1969) was the first to articulate the range of ways which the public can participate in decision making in the Ladder of Citizen Participation, and the eight rungs of the ladder ranged from no power (manipulation) to citizen control. Today, the International Association for Public Participation Spectrum of Engagement (IAP2 2018; Figure 1) spells out five levels of how to engage stakeholders effectively and positively, ranging from inform to empower. This tool is useful for communicating expectations and designing engagement processes and has been adopted in its entirety or slightly modified by many organizations (e.g., White House Council for Environmental Quality, USEPA, U.S. Army Corps of Engineers). While it is tempting to assume that more participation is always better, every situation is different and the level of engagement must be appropriate to the needs of the project and to the participants whose input you seek.

Multiple levels of engagement are often combined within one process. For example, 'Inform' in which information is shared out to participants is a helpful prerequisite for enabling stakeholders to participate effectively. 'Consult' is also one-way communication, but in the opposite direction; participants provide feedback to the convening entity. The next three types: *Involve*, *Collaborate*, and *Empower* involve two-way dialogue with increasing intensity, and increasing sharing of responsibility for the decision. These levels of engagement are most successful when all parties are open-minded, respectful, and willing to listen because they value everyone's contribution. When this is the case, these types of engagement enhance the relationships, trust, and understanding that enable the realization of the benefits described in the introduction.

2.1.2. Best practice: ensure balanced participation and compensate for power imbalances

All stakeholder engagement processes should continually work toward inclusivity and diversity of representation to ensure that all perspectives are at the table. This is necessary for every level on the spectrum but is critical for interactive levels to ensure a fair and thorough process. Identifying all the perspectives and stakeholders who need to participate is an important preliminary step and may require significant investment to do so effectively. To ensure all voices can be heard in equal measure, interventions may be necessary to compensate for power imbalances between participants. Examples include placing limits on the number of attendees who represent entities with significant resources, experience, and/or legal staff so that they do not dominate the process, or giving additional support to those with few resources, such as socially vulnerable populations, to ensure that they are able to participate fully. Examples of the latter are calling, sending letters, or visiting those without access to email, and providing transportation or childcare for in-person meetings.

2.1.3. Best practice: value local knowledge

Although it is not always obvious to technical experts, stakeholders frequently have a wealth of knowledge they can contribute to the effort. Stakeholders may provide local historical context, observations and knowledge, on-the-ground experience, their own interests and values and those of the community, and scientific data, gained through their relationship to or experience with the project location. While technical information informs what is possible, community values inform what is preferred. Appreciating this difference clarifies the importance of stakeholder input for achieving sustainable and resilient water use decisions. Therefore, it follows that successful stakeholder engagement requires careful listening to all perspectives. Stakeholders who feel their contributions are heard, respected, and considered in the decision-making process or effort, will be more willing to fully invest their time and energy to the process.

2.1.4. Tools: interest-based negotiation, decision analysis, and systems modeling

An array of available decision support tools enables facilitators to guide stakeholders through transparent and inclusive decision-making processes. Interest-based negotiation expands the possibilities for finding options that meet multiple interests. Participants frequently initiate negotiations by stating their preferred position (e.g., *I want you to provide bottled water to my house*). However, stated positions are inflexible and often conflict with others' positions. Interest-based negotiation encourages participants to share *why* they want what they want (e.g., *I want to have access to clean water that I feel safe using and drinking*), so that it is possible to identify common ground and to create mutually beneficial solutions (Fisher *et al.* 2011). Decision analysis techniques help stakeholders test and articulate their preferences through comparing and ranking lists of interests. Decision analysis also spells out ways to convert stakeholder preferences to quantifiable metrics,

so that alternatives can be compared. Once stakeholder preferences are identified, a systems model can analyze how interconnected aspects of the system will respond to alternative actions and provide quantitative output regarding each of the metrics. Systems analysis enables us to look at multiple factors in a system (e.g., water quantity, quality, ecosystems, climatic changes, and human demands) as they change over time and with alternative interventions. Considering the whole system in our decisions will increase the chance of achieving more sustainable and resilient futures.

2.2. Weaknesses within the practice of stakeholder engagement

Despite the many advances within the field of stakeholder engagement, challenges still remain in planning for and conducting stakeholder engagement.

2.2.1. Resource challenges

Stakeholder engagement can be resource-intensive, especially in low-trust situations where limited or negative relationships with stakeholders exist. Compounding this, technical project managers may not appreciate the value that stakeholder engagement can bring to the project and may be unwilling to allocate sufficient resources for conducting effective stakeholder engagement. For example, in the authors' organization, policy changes have limited the total allowed time and budget for all new planning projects, making it more challenging to keep stakeholder engagement a priority.

2.2.2. Designing stakeholder engagement is a subjective art

Determining the appropriate level of stakeholder engagement is more of an art than a science. Leaders must weigh the risks along with the costs and benefits of how much to invest. Lower controversy projects may be successful with minimal engagement, while high-conflict projects will require extensive engagement for success. The gamble is that you can never fully know how conflicts will emerge or develop, even when you assess the situation in advance. An example of this occurred while launching a new collaborative watershed planning initiative in the central U.S. The lead agency assumed that established partners would be fully supportive. However, when the partners heard about the proposed effort, they raised significant concerns. Convening an unplanned pre-meeting resolved these concerns. Had the partners' concerns not been resolved beforehand but instead raised during the large stakeholder workshops, the whole event could have been derailed.

2.2.3. Reluctant staff

Staff may be hesitant to open themselves to stakeholders, due to a lack of skills, experience, or confidence to engage stakeholder groups – especially in conflictive situations. Occasionally, stakeholders harbor intense negative feelings from past transgressions by the convening entity, and will take it out on the current representatives, even when those individuals had no role in the historic action. This is not uncommon with large federal agencies with long histories with a community or location. Even in the best situations, it is human nature to prefer to 'streamline' the effort by simply making decisions independently of stakeholders and moving forward quickly. Sometimes that gamble pays off in the short term or is appropriate because of the urgency of an emergency situation, but often it is likely to reduce trust, and cause excessive and costly delays from stakeholder resistance and lawsuits on that project as well as on future projects.

2.2.4. Multiple communication channels

While social media platforms have expanded access to reach more people, they have also created a highly fractured communications landscape. Having multiple channels to reach stakeholders may increase the number of people reached, but it also increases the level of effort required to deploy and monitor each of the channels to reach and hear from all stakeholders. Furthermore, communities and individuals use platforms differently so what is most effective in one community may not reach many people in another community. Public affairs officers may share information through websites, Facebook, Twitter, YouTube; and need to monitor comments on these and other social media platforms to track interest and concerns, and to correct misinformation.

2.3. Opportunities that promote stakeholder engagement

External factors of established norms, increased stress on water resources, and technology advances provide opportunities for stakeholder engagement to evolve and increase success in water resources decision-making.

2.3.1. Stakeholder engagement is a norm

With 50 years of efforts in engaging stakeholders in dialogue and decision processes, engagement is now an established norm among those leading processes as well as among the stakeholders who participate. There is an understanding within organizations from leaders, managers, and staff that stakeholder engagement should occur, even if they are not entirely clear how to conduct it. Those who participated in any past events will be able to build on those experiences (both successful and less effective) when participating in future events. Thus, future stakeholder engagement sessions may be easier to convene and conduct if many of the participants have been involved in effective engagements in the past.

2.3.2. Increasing stressors on water requires more collaborative dialogue

Paradoxically, increased stress on water from climate change, increasing population, and aging infrastructure makes stakeholder engagement more vital. We have the opportunity to engage the stakeholders in meaningful dialogue on these changes and what that means for investments in water infrastructure reliability, in acceptable demand management measures or the tolerable level of water use restrictions. As conflict increases, so does the need for collaborative dialogue and improved stakeholder engagement.

2.3.3. Technology allows greater participation

Technology allows participation by greater numbers of people. What was limited in the 1970s to in-person meetings and notices through newspapers evolved to include interactive web-based forums, email distribution lists, and the ability to hear from vastly more voices. Virtual meetings and asynchronous dialogues allow people to engage on their schedule without having to travel to in-person meetings. The adoption of virtual engagement accelerated since the global COVID pandemic forced quarantines. With many more people now comfortable using remote meeting technologies, we anticipate their continued use for the foreseeable future. The advantage of having more opportunities to get and use input from more groups, individuals, and communities is a significant boost to the field.

2.3.4. Technology allows more forums for meaningful engagement

Technology allows us to have more robust discussions with better informed stakeholders. So much more information is readily available to stakeholders through the internet. Stakeholders are no longer limited to learning about a project from a physical copy of a technical report, nor contributing only via meetings, phone calls, and mail-in comment cards. Today, water managers can help stakeholders learn and contribute to projects by providing searchable data and analysis, sharing videos, offering interactive geospatial technologies, and hosting interactive web-based forums. While there is still a lot to learn about how to best employ available tools to support stakeholder engagement, clearly the opportunities are broad.

2.4. Threats to the future of stakeholder engagement

We see three interrelated threats or challenges to be navigated when conducting stakeholder engagement today and the foreseeable future. External factors of overreliance on technology for communication, the rapid spread of misinformation, and reduced trust in institutions are challenges to leading stakeholder engagement processes effectively.

2.4.1. Reduced trust in institutions

A minimum level of trust in the convening entity is needed for stakeholders to be willing to invest their time and energy in a participatory process. Trust helps open communication, increasing the willingness to listen with an open mind and to share openly. In the U.S., trust in the federal government in particular has declined since the 1960s. Fortunately, trust in state and local governments has been more stable (Figure 2). Federal agencies can increase their effectiveness by coordinating with state and/or local agencies on any stakeholder outreach and engagement activities. In managing water resources, the scale of the effort can influence the relationship with stakeholders. In basin-wide efforts, building relationships and trust over a large geographic area is challenging but not insurmountable. For example, the longest river in the United States, the Missouri River, drains an area of 1.37 million km² that includes two Canadian provinces, 10 U.S. states, and 29 Native American reservations. Management of water in drought and flood years is extremely challenging given the multiple uses, including irrigation, navigation, hydroelectric power generation, fish and wildlife enhancement, recreation, municipal and industrial water supply, and flood risk management. Stakeholder conflict and distrust was straining the effectiveness of managing water in the basin. In 2008, the Missouri River Recovery Implementation Committee was formed to negotiate agreements on implementing a recovery plan for threatened and endangered species. The 70 members with balanced representation

Federal government consistently viewed less favorably than state and local govt.

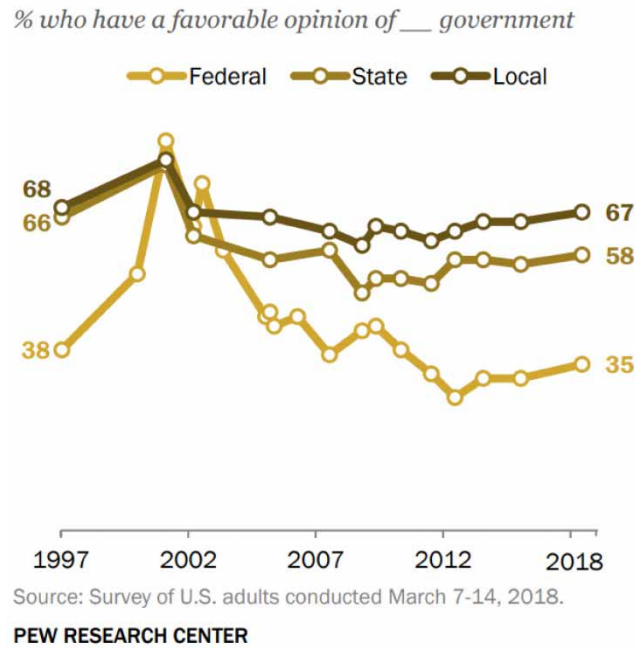


Figure 2 | Decreasing trust in federal, state, and local government in the United States (Pew Research Center 2018).

across the basin are led by a neutral facilitator. Federal agencies do not participate in decisions but support and inform the committee (MRCDC 2022). Since formation, trust between stakeholders and the federal agencies has increased severalfold, and the committee has remained productive.

2.4.2. Overreliance on technology to achieve communication goals

The ubiquity of and reliance on internet-based technologies has its downsides. While recent experience with virtual public meetings and webinars realized remarkable increased participation compared with pre-pandemic levels, we are concerned about technology excluding certain perspectives, particularly those socially vulnerable populations who lack access (e.g., elderly, and those who do not speak the dominant language). Furthermore, the quality of interaction over virtual channels is different than in person. Generally, virtual communication does not encourage direct communication, build human connection, nor build trust. Therefore, it may be detrimental if relied upon over the long term.

2.4.3. Prolific spread of misleading opinion and information

In this information age, anyone with access to the internet can easily share information and opinions, whether true, false, positive, or negative. This has led to an explosion of information. The more sensational statements tend to spread more rapidly, and organized groups can control narratives. Thus, the public and stakeholders form preconceived opinions about what is really happening, about agency decisions, and about the trustworthiness of agencies. Countering false information is a near insurmountable task, but getting information out preemptively can help reduce the impact of false rumors.

3. THE ROLE OF STAKEHOLDER ENGAGEMENT ON THE PATH TO SUSTAINABLE WATER MANAGEMENT

The ability to engage stakeholder groups effectively will remain a critical aspect of future water supply management success. Many of the current opportunities and threats described above will continue or even accelerate in the future. In particular, the stressors of climate change, population growth, and aging infrastructure are each unrelenting and their combination will exacerbate conflicts in water resources management. At the same time, the use of technology to spread (mis)information,

express dissent, and influence government action will continue for the foreseeable future. Collaborative skills and processes will become ever more valuable for creating the window of opportunity for reconciling water issues.

The following are considerations for building the path to sustainable future in water management.

1. Engagement will need to be *nimble and flexible* in the short term to be able to provide, receive, and respond to information in a timely basis for all stakeholders. Agency staff must have the time and ability to engage across multiple platforms to ensure that false information or stakeholder concerns are acknowledged and addressed rapidly and transparently. Such responsiveness will be essential for keeping up with the pace of change and information exchange.
2. Implementation of collaborative processes will continue to occur mostly at the *local level*. While national level policy discussions will impact decisions (and availability of federal funds), stakeholder engagement about water supply and water management decisions will continue to be crucial at the local level because that is where the impacts are felt, because that is the appropriate scale for most water decisions, because the local level is where trust is most essential and readily built and because local voices are demanding to be heard.
3. With diminished trust in government, making progress on water supply and water resource issues will increasingly require the *private sector and nonprofits* to promote, finance, and lead stakeholder engagement activities. Private sector companies and foundations can host and finance discussions on controversial topics for which governments lack the resources or are viewed as biased. More nimble community-based nonprofits may be better positioned to convene collaborative processes and pursue funding for stakeholder engagement. Such processes can lay the groundwork for ultimate decision making by governments.
4. To justify continued investment in stakeholder engagement, convening entities need to invest in *measuring and communicating the benefits* of collaborative processes and on helping practitioners determine the appropriate engagement tools and techniques for the situation.
5. Although the focus on graphical, video, and geospatial tools and technologies will keep increasing, these will need to be complemented by continued focus on the *foundational principles* of communication – *trust, empathy, connection, shared meaning, honesty, and positive intent*. It will be hard to keep these principles firmly front and center – but without them no amount of technical advances will accomplish stakeholder engagement goals.

We have highlighted the strengths of engagement, associated best practices, as well as existing and emerging challenges as we see them. The community of water resource researchers and practitioners has vast experiences with different types of engagement. Thus, there is much to learn from each other about which approaches work and in what contexts, and how advances in technical tools have successfully supported communication for engagement. We encourage the water resources community to describe and share these experiences candidly. Bringing together this extensive knowledge and understanding will help define critical processes and practices that can meet the next generation of challenges in water supply and water resources management.

DATA AVAILABILITY STATEMENT

All relevant data are included in the paper or its Supplementary Information.

CONFLICT OF INTEREST

The authors declare there is no conflict.

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