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Scarce Water in Site: A Content Analysis of News Coverage of the Sites Reservoir Project

Cara Lawson
The Ohio State University

Richard Austin-Castillo
Oregon State University

Lauren Chase
Oregon State University

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Abstract

Plagued by recent and historic drought, the need for water storage and management solutions in California is apparent. As a potential solution, the Sites Reservoir project offers an opportunity to a state eager to conserve and better manage water. The Sites Reservoir project involves complexities from a variety of standpoints and stakeholder perspectives. This study investigated the frames and sources used by The Sacramento Bee to communicate about the Sites Reservoir project over a 10-year period. The most frequently used frames throughout the dataset were “policy and government” and “water conscious,” and the sources most frequently utilized for information about the project in the articles were elected officials, government agency representatives, and nonprofit representatives. The findings suggest water management is linked with political activities and supports the assertion that the media tend to focus on the role of policy and political opinion in water management issues. At the same time, the findings suggest the need for water solutions is evident, given the prominence of the “water conscious” frame. Future studies should evaluate frames over time, and investigate the potential nuance between frames used to communicate about water management in different areas of the United States facing water management issues.

Keywords

framing, sources, water conservation, water management

Introduction

For some states water management, use, and rights have long been topics of controversy and debate. Issues associated with water in California can be traced back to the 1800s when multiple flooding disasters led to legislation that aimed to improve the state's ability to use water resources most effectively (Water Education Foundation, 2021). Efforts to address water concerns have been unfolding in the state since then. In the early part of the twentieth century, the federal government and state of California implemented policies to construct a vast grid of canals, dams, pipelines, and reservoirs to store and transport nearly 200 million acre-feet of water from north to south (California Department of Water Resources 2021; Stokstad, 2020). California has nearly 1,500 reservoirs, 240 of which account for 60% of the state's water storage capacity (Escriva-Bou et al., 2021). The state takes water management seriously; more recently however, a drought that began in 2011 and ended in early 2019 revealed the state's water storage and management capacities were in need of review (National Integrated Drought Information System, 2021). A reprieve from the drought lasted 16 months, returning in early 2020 (National Integrated Drought Information System, 2021).

The need for more water storage in California through reservoirs and other surface water supplies has been established (Yates et al., 2009). Faced with a dwindling fresh water supply, Californians seek water storage solutions (Kasler & Sabalow, 2019). One potential solution to address the state's water challenges is the construction of the Sites Reservoir. When complex issues arise, the media promotes frames influenced by a variety of factors – from unfolding events to involvement from stakeholders. When issues are associated with complexity and a variety of stakeholders are involved, the media employ frames to make sense of issues and simplify information (Gamson & Modigliani, 1989; Scheufele & Tewksbury, 2007). As issues with California's water resources continue to unfold, a range of media frames to communicate about the issue are possible. The purpose of this study was to investigate how *The Sacramento Bee* framed the Sites reservoir project over a ten-year span.

Sites Reservoir

The Sites Reservoir project is not a new idea or unfamiliar proposal to the state of California. In fact, it was first suggested four decades ago to address growing need and concern for water resources (Water Education Foundation, 2021). For the most part, however, the project was put on hold until 2010 when Sites Project Authority formed to lead and advance the project (Municipal Water Leader, 2021). The project is a multibillion-dollar proposal partly funded by bonds issued through the Water Quality Supply and Infrastructure Improvement Act of 2014, which authorized more than $7 billion to fund water supply infrastructure, and other water management and protection projects (California Natural Resources Agency, 2015). The purpose of the reservoir is to collect water during high flood periods and store the collected water for future uses (Northern California Water Association, 2019). The Sites Reservoir project offers potential solutions to a state eager to conserve and better manage water by increasing flexibility, reliability, and resiliency in the water supply during drought years (Sites Reservoir Authority, 2021). In total, the reservoir will be able to hold enough water to cover between 1.2 and 1.8 million acres of land (Kasler, 2017). The water is earmarked for uses related to agriculture, ecosystem improvement, drought preparedness, and statewide water system improvement (California Natural Resources Agency, 2015). Although much of the project is still in the

planning phase and under design, the Sites Reservoir project is slated for completion in 2030 (Municipal Water Leader, 2021).

Stakeholder Perceptions of Water Issues

Due in part to the variety and number of stakeholders with interests in managing water resources, it is reasonable to assume mixed understandings and perceptions abound. However, as managing water resources is increasingly evolving as a participatory process, the perceptions and concerns of stakeholders are important to understand (Faust et al., 2013). When it comes to perceptions of water quality and access, many believe the government is responsible for clean water (Noga & Wolbring, 2013). Another point of varying opinion arises when the perceived need for water infrastructure projects and support for undertaking infrastructure projects are discussed. While these variables are independent of each other, those who perceive water infrastructure as a needed resource tend to support the development of new water infrastructure (Faust et al., 2013).

Given the nature and scope of the proposal, the Sites Reservoir project involves complexities from a variety of standpoints and stakeholder perspectives. Various societal groups including industrialists, scientists, politicians, members of the public, non-governmental organizations, and water managers are concerned with sustainable water management (Gooch & Stalnacke, 2010). Each of these stakeholder groups may seek to influence the ways in which the issue is communicated via the media (Nisbet & Huge, 2006). Stakeholders, like those listed above, commonly utilize media platforms to advocate for the audiences' preexisting interests (Weigold, 2001). The high-stakes and controversial nature of water management also lends great potential for the issue to become intertwined with political activities (Greenhut, 2021). The role of policy and the promotion of political opinion through media channels and platforms cannot be overlooked as the media communicate the role of policy and political opinion in water management to the public (Sheeler, 2020). Further complicating the issue is the complex nature of communicating from a perspective of scientific research. Scientists working to address factors within issues of science and natural resources sometimes engage in media efforts but find challenges when they seek to explain unfamiliar and complex concepts, and potentially contribute to misinterpretation (Liang et al., 2014).

Theoretical Framework

To more thoroughly understand the ways in which the Sites Reservoir project is being communicated in the media, framing theory was used to guide this study. Gamson and Modigliani (1989) argued that framing is the “central organizing idea or storyline that provides meaning” (p. 143). When an issue is complex, frames help make sense of relevant events (Gamson & Modigliani, 1989) and make complicated information more understandable (Scheufele & Tewksbury, 2007). Frames also help to communicate information about an issue by defining problems, diagnosing causes, and suggesting remedies (Entman, 1993).

Framing also encompasses the notion that emphasis on certain issue elements over others creates potential to impact the ways in which the public views the issue (Chong & Druckman, 2007; Scheufele & Tewksbury, 2007). Further, this selection of particular aspects of an issue can promote certain interpretations and understandings about the overall issue (Entman, 1993). In turn, these interpretations and understandings can play a role in the construction of peoples’

perspectives of the situation or matter at hand (Scheufele, 1999). The way an issue is framed by the media can also influence an individual's way of thinking about the issue (Kim et al., 2002), and their beliefs about its importance (Nelson & Oxley, 1999). An exploration of frames used to communicate about the water issues and a specific potential solution in California can help shed light on this complex topic. Frame analysis can lend insight to how an issue was communicated to an audience and how that audience might perceive the issue (Scheufele & Tewksbury, 2007).

Issues with water management, especially concerning the role of the media, are largely unresearched. However, some scholarship has yielded varying insights on how the issue has been communicated in newspapers. In an assessment that explored policy actor groups' narrative debates about urban flooding in Nigeria, Adekola and Lamond (2018) found frames used by local and national newspapers to largely focus on human causes of flooding. In another study, the complexity and variety of factors associated with water concerns could play a part in the differences in frames and coverage in newspapers in the western United States (Flint et al., 2019). Despite the shared issues associated with water, the element of local nuance is present when communicating about water issues (Flint et al., 2019). Water issues are communicated in other media sources as well. Dobelbower (2018) examined how the future of the Ogallala Aquifer, the largest aquifer in the United States, was framed in both agricultural and mainstream media publications in the southern and midwestern regions of the United States. In this study, Dobelbower (2018) found the mainstream media implemented frames associated with policy and the environment, and for government officials and farmers to be common sources.

From a different perspective, another study explored media representations of water issues in relation to issues of public health risk and found little evidence of water-related health impacts in newspapers in the western United States (Mayeda et al., 2019). Finally, a study that investigated the reporting of water issues in Nebraska revealed a lack of coverage except when issues were of immediate concern to the public (Altaweel & Bone, 2012). However, when water issues were reported the relationship between water and agriculture was the most prevalent topic reported upon (Altaweel & Bone, 2012).

As water scarcity awareness and concerns increase on a national level, so does the need to generate constituents' support for water issues (VanDyke & Callison, 2018). To generate this needed support, information from the media may be helpful. Individuals who are not involved in agriculture or natural resources commonly use mainstream news publications such as newspapers, magazines, and social media to information regarding current policies, weather, events, technology, and more (Dobelbower, 2018). The media display information which influences the public's perceptions of what the important issues are in their worlds. Additionally, in some cases the mass media may be the only contact many people have with certain topics, which can shape their opinions on these topics depending on how the topic is framed (McCombs & Shaw, 1991).

Monitoring the coverage of long-term events can indicate the salience and understanding of those events to the public (Scheufele, 1999). Past studies regarding the Sites Reservoir project have lacked analysis from a social science perspective and have largely focused on physical and environmental assessments involving water, sediment, and mercury levels (Rytuba et al., 2015; Suchanek et al., 2010). When analyzing frames used in news media coverage, it is important to consider the framing influence in how the public understands the issue (Ruth et al., 2005). In the case of the Sites Reservoir project, the frames employed and sources relied upon by *The Sacramento Bee* newspaper from 2010 to 2020 can provide insights regarding the nature of this complex issue and the media's role in communicating about it. This research also seeks to

address a complex problem and key issue of natural resource management and climate change in need of a viable solution.

Purpose and Research Objectives

As explained above, the purpose of this study was to investigate how *The Sacramento Bee* framed the Sites Reservoir project from January 1, 2010 to December 31, 2020. The following research objectives guided this study:

1) Identify and compare news frames used in media coverage pertaining to the Sites Reservoir project.
2) Determine the frequency of news media coverage pertaining to the Sites Reservoir project.
3) Compare the frames used within the types of articles about the Sites Reservoir project.
4) Determine the sources used for information about the Sites Reservoir project.

Methodology

Quantitative content analysis was used to determine how the Sites Reservoir project was framed in *The Sacramento Bee* from January 1, 2010 to December 31, 2020. Quantitative content analysis refers to "the systematic assignment of communication content to categories according to rules, and the analysis of relationships involving those categories using statistical methods" (Riffe et al., 2014, p. 3). Content analysis involves objective, systematic analysis of message characteristics (Neuendorf, 2002). Newspaper articles were selected as the source of data for this project. An analysis of newspaper articles was appropriate given that traditional news coverage in convenient for readers and has been linked to gains in trust (Baranowski, 2019). While the Sites Reservoir project affects communities outside of Sacramento, *The Sacramento Bee* was selected for this study given its status as a top newspaper by circulation in the state of California (Agility PR Solutions, 2021), its location in the state capital, and its proximity to the proposed project site.

Articles were collected via the NewsBank Database using the term "Sites Reservoir" and date range between January 1, 2010, to December 31, 2020. This timeframe was selected in order to compare frames over the period of time in which California faced its longest, and one of its most extreme, drought periods. A total of 79 articles were initially collected, but a final sample of 64 articles were subsequently analyzed after the removal of duplicate articles and articles unrelated to the issue. The primary instrument for this study was a researcher-developed codebook and code sheet. Using the emerging coding method, the categories were established after some initial data observations (Stemler, 2000). Sections in the codebook included 1) general article information, 2) frame, and 3) sources.

General article information collected prior to coding the article for frame and sources included publication date, article title, and type of article (news, opinion, or feature). The codebook included a detailed definition for each frame in order to assist the researchers in identifying the frame present within each article. Frames were coded as 1 = *present*, and 0 = *not present*. Codes and descriptions for the following frames were included in the codebook (Table 1): "economic," "environmental impacts," "policy / government," "legal," "advocacy / awareness," and "other." Sources were coded when an individual, organization, or other entity

was quoted or mentioned as the originator of information. Ten source types were included in the codebook, including: “non-profit representative,” “elected officials and representatives,” “Sites Reservoir project representative,” “governmental agency representative,” “community member,” “farmer / agriculturalist,” “attorney,” “university representative,” and “other.”

Table 1

Frames Used by The Sacramento Bee *to Communicate About the Sites Reservoir Project*

Frame	Description
Economic	Refers to financial or economic aspects as a result of Sites Reservoir such as job creation, cost of the project, future financial benefits or taxes.
Environmental Impacts	Refers to Sites Reservoir’s impacts on the ecosystem, wildlife, water quality, or other environmental elements.
Policy/Government	Refers to government or elected official involvement on the issue such as a new policy, program, initiative, law, bond, regulation, or other measure regarding Sites Reservoir.
Legal	Refers to focus on a lawsuit or court hearings regarding the Sites Reservoir.
Advocacy/Awareness	Refers to non-government groups working to share information, for or against, Sites Reservoir through stakeholder involvement.
Water Conscious	Refers to arguments expressing the need for more water supply and storage.
Other	Frame of article does not fit any of the frame descriptions listed above.

After the codebook was developed, two researchers were trained to utilize the codebook, verify its clarity, and determine reliability. Intercoder reliability is used to evaluate the validity of data and aid in future replication of a study (Riffe et al., 2014). A pilot study using similar articles from a different newspaper was completed prior to the evaluation of the articles collected for the study. While no standard for subsample size in reliability assessments has been established (Neuendorf, 2002), 10% to 25% of the sample has been recommended (Wimmer & Dominick, 2011). With this recommendation in mind, the coders analyzed 16 articles independently. The results between coders were visually analyzed and inconsistences justified further discussion and revisions to the codebook to better refine and reach a stronger comfort level with the strategy for coding (Neuendorf, 2002). A new frame code, “water conscious,” was added to the codebook in order to better capture distinctive characteristics between similar frames. A second coder training was held to discuss inconsistencies and revisions to the codebook. Following the second coder training and the distribution of new coding sample, acceptable Krippendorff’s alpha levels were achieved with scores ranging from 0.70 to 1.0 across frames (Riffe et al., 2014). One researcher coded the remaining 32 articles.

Findings

Objective one sought to identify and compare news frames used in media coverage pertaining to the Sites Reservoir project. Table 2 details the frequency of each frame. Despite the potential for a variety and multitude of frames, the articles within the sample had one of four frames present. Newspaper articles discussed the Sites Reservoir primarily through the "policy/government" frame (33%, *n* = 21). This frame focused on elected and government officials' involvement in the project in terms of new policy, programs, initiatives, law, bonds, regulations, or other policy or government-related measures. Example headlines for the "policy/government" frame included, "Voters OK'd billions for new reservoirs in 2014," and "Government red tape holds up water supply."

The newspaper's second most frequently used frame was "water conscious" (28%, *n* = 18), which typically focused upon the dwindling water supply and need for better and more water storage. Example headlines for articles that featured the "water conscious" frame included, "Drought and storms prove again California needs more storage," and "Farms are growing in the Valley, but they need water to thrive." The "economic" frame was the next most frequently used frame present in the dataset (23%, *n* = 15). An example of an article with the "economic" frame was "Don't be rushed in awarding water storage billions." The least frequently occurring frame was "advocacy/awareness" (16%, *n* = 10), which was featured in articles with headlines such as "State needs to invest in Sites Reservoir – Sites Reservoir would help commerce, farming, and the environment."

Table 2

Frequency of Frames Used in Articles About Sites Reservoir (N = 64)

Frame	*n*	*%*
Policy / Government	21	33
Water Conscious	18	28
Economic	15	23
Advocacy / Awareness	10	16
Total	64	100

Objective two sought to determine the frequency of news media coverage pertaining to the Sites Reservoir project (Table 3). The number of articles appearing in the dataset varied each year with the majority of articles being published in 2016 (23%, *n* = 15), followed by 2015 (22%, *n* = 14), and 2018 (20%, *n* = 13). There were no articles published regarding the Sites Reservoir project in 2020, and only one article appeared in the years 2012 and 2019, respectively.

Table 3

Frequency of Coverage per Year Articles Referred to Sites Reservoir (N = 64)

Year	*n*	*%*
2010	2	3
2011	2	3
2012	1	2
2013	2	3
2014	8	13
2015	14	22
2016	15	23
2017	6	9
2018	13	20
2019	1	2
2020	0	0
Total	64	100

The third research objective sought to compare the frames used within the types of articles about the Sites Reservoir project (Table 4). The most frequently occurring article type in the dataset was news stories (50%, *n* = 32), which tended to use the "policy/government" frame (18.8%, *n* = 12) the most frequently, followed by the "economic" frame (14.1%, n = 9). In opinion articles (29.7%, *n* = 19), such as editorials and op-ed pieces, the frame that appeared the most frequently was "water conscious" (10.9%, *n* = 7). In feature story articles (20.3%, *n* = 13), the "policy/government" and "water conscious" frames (6.3%, *n* = 4) were equally the most frequent frame type present.

Table 4

Comparison of Frames by Article Type (N = 64)

	News		Opinion		Feature	
Frame	*n*	%	*n*	%	*n*	%
Policy/Government	12	18.8	5	7.8	4	6.3
Water Conscious	6	9.4	7	10.9	4	6.3
Economic	9	14.1	4	6.3	3	4.7
Advocacy/Awareness	5	7.8	3	4.7	2	3.1
Total	32	50.0	19	29.7	13	20.3

Objective four sought to explore the sources used for information about the Sites Reservoir project. A total of 115 sources were used throughout the 64 articles in the dataset. As outlined in Table 5, the most referenced source was elected officials (33%, *n* = 38), which included the elected officials, or their spokespersons, at the local, state, or national level. This category of sources included persons such as U.S. and state senators, representatives, commissioners, and attorneys general. Other highly-referenced sources were government agency representatives (28%, *n* = 32). These sources were from organizations including the U.S. Environmental Protection Agency, Department of Fish and Wildlife, and county water boards. Non-profit representatives also appeared as sources within the dataset (19%, *n* = 22), representing advocacy groups such as the Sierra Club, Planning and Conservation League, Natural Resources Defense Council, Northern California Water Association and others. The least frequently-occurring sources included farmers (3%, *n* = 3) and attorneys not associated with any of the other source types (2%, *n* = 2).

Table 5

Source Types Referenced in Articles of Sites Reservoir (N = 115)

Source	*n*	*%*
Elected Official	38	33
Government Agency Representative	32	28
Nonprofit Representative	22	19
Sites Reservoir Representative	8	7
Community Member	5	4
University Representative	5	4
Farmer	3	3
Attorney	2	2

Discussion

This study sought to determine how a top state newspaper framed a potential solution for the complex water issues facing California. While this study was limited to the findings from only one newspaper and the data were not coded for tone, we argue this work contributes to a greater understanding the media's role in communicating complex issues in agriculture, science, and natural resources. Water management is not a new topic but is an issue that impacts nearly every person in some way. The findings here lend insights to stakeholder involvement, specific areas of concern, and potential understandings about water management in California.

In this study, elected officials and government agencies were the most referenced sources, and the most prominent frame was policy / government. These findings support the

argument that political activities are linked with water management (Greenhut, 2021) and that the media tend to focus upon the role of policy and political opinion in water management issues (Sheeler, 2020). Further, the prevalence of the water conscious frame suggests a potential attempt to advocate for audience interests (Weigold, 2001), especially given the prevalent use of this frame in opinion articles. It is possible, given the nature of these frames, that one influences the other as policy makers seek to address issues facing their constituents through policy and legislation.

Media frames are storylines and organizing ideas that provide meaning and help make sense of relevant events and complex issues (Gamson & Modigliani, 1989). The variety of frames present within the dataset of this study suggest potential for audiences to have diverse views of the issue (Chong & Druckman, 2007; Kim et al., 2002, Scheufele & Tewksbury, 2007) and varying levels of perceived issue importance (Nelson & Oxley, 1999). The prominence of frames with focus on policy and government, and water consciousness uncovered in this study imply the readership of *The Sacramento Bee* may perceive the Sites Reservoir project to largely be an issue of politics and government and/or a means to address the significant need for more water supply and storage (Scheufele & Tewksbury, 2007). At the same, the sources relied upon by *The Sacramento Bee* for stories about the Sites Reservoir suggest a number of defined problems and potential solutions are up for consideration (Entman, 1993).

The volume of articles appearing between 2014 and 2018 coincided not only with some of California's most devasting drought years, but also significant election years which suggests the potential for the promotion of water topics as political issues at the forefront of policy decisions. The year 2016 saw the largest number of articles in this study and also occurred simultaneously with a national election. It is possible this peak in articles was observed due to the potential for federal aid to address water conservation issues. While issues with drought continue to plague California, and an increase in articles in the years 2019 and 2020 were expected due to another drought, the increased winter precipitation at that time and likely dominance with coverage regarding the Coronavirus pandemic explain the absence of coverage.

Despite similar findings in terms of common frames, unlike the Dobelbower (2018) study, this research found little evidence of a first-hand farmer voice promoted in a popular mainstream newspaper. Other studies, too, have found evidence of the relationship between water and agriculture in the media (Altaweel & Bone, 2012). The missing farmer voice in this study could be due to regional differences in reporting preferences or, given the complicated nature of water conservation, there may be nuance within frames between regions that affect the sources media outlets look to for information.

It is also interesting to note the frame for each article in the dataset was coded into one of four categories despite the potential for even greater variety as was suggested by the issue's complexity and numbers of groups of individuals involved (Gooch & Stalnacke, 2010). This finding suggests water and other climate issues may tend to be framed in a certain way depending upon timing and other influences. As the water crisis and extreme weather conditions persist, studies such as this should be conducted again in the future to determine any changes in frames over time and as future related events unfold.

Conclusions and Recommendations

Addressing issues with water conservation will take the involvement from stakeholders of all sectors. As effects of climate change continue to evolve, solutions to manage future needs

must be developed. For California, addressing the water crisis is key to maintaining the economy, agriculture production, and community health. Long-term plans are required to reduce reactive responses. When communicating on the topic of water conservation, journalists and reporters should look beyond politicians and those involved from a policy-driven standpoint and focus on stakeholders such as farmers, ranchers, community members, environmentalists, and scientists for longer-term solutions and different perspectives. To capture the degree of severity on the issue, local leaders within areas highly impacted by the issue should also be relied upon by journalists.

The Sites Reservoir project offers potential to aid California in its efforts to conserve water, but support from constituents will be needed (VanDyke & Callison, 2018). To encourage greater constituent support for water issues, journalists should consider framing messages that focus on the potential negative impacts of food supply and prices if California does not have proper water allocation for high food-producing regions (VanDyke & Callison, 2018). As the world population increases and the need for more food grows along with it, it will be necessary to effectively communicate about water matters, especially in areas that produce a high volume of agricultural products, which may rely on specific water sources and practices (Dobelbower, 2018). Media outlets such as *The Sacramento Bee* can be used to provide information and updates on complex issues in agriculture and natural resources given their potential to shape and influence public opinion (McCombs & Shaw, 1991).

Like many studies, this study exposed many opportunities for future research. Given the variety of sources referenced by The Sacramento Bee, future studies should seek to explore any potential relationships between prevalent news frames and issue beliefs, attitudes, and perceptions. At the same time, the complex nature of water issues and potential nuance between frames used in different media outlets calls for future studies to more closely investigate distinctions in frames presented by media outlets between different regions afflicted with water conservation issues. Additionally, given the potential roles of timing and other influences, we suggest future studies compare specific events in relation to the media's use of frames to determine any potential influences or characteristics that may impact how media organizations frame the issue. Finally, to expand understandings related to how common media frames are perceived by varying stakeholder groups and audiences, future studies should also explore the attitudes, beliefs, and perceptions regarding media messages about issues such as water management.

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