Newspaper coverage of water issues in China from 1950 to 2000

Wenxiu Shanga, Hang Zhenga,*, Zhongjing Wanga, Baimaqvzongb and Yongping Weic

aState Key Laboratory of Hydro-Science and Engineering, Department of Hydraulic and Hydropower Engineering, Tsinghua University, Beijing 10084, China
bCorresponding author. E-mail: zhenghang@mail.tsinghua.edu.cn
bTsinghua University, Room 324A, Building 34, Beijing 10084, China
cAustralia–China Centre on Water Resources Research, The University of Melbourne, Melbourne 3010, Australia

Abstract

Mass media are important sources of information about water issues that significantly influence civil life. This paper presents a content analysis approach to contextualize the water issues reporting of the People’s Daily. The intent of our approach is to uncover the reporting pattern of water issues and the relationship between government policies and their news reports. Using the newspaper with the second widest circulation in China, the content analysis approach reveals that the document frequency of water issues had shown a flat trend since the 1970s. Water-related articles were given more significance by providing additional front pages. The results suggest that newspapers have been focusing more on the recreational function and protection of water since the 1980s. The results also show that there was a relative shortage of coverage on certain types of water-related central government documents. Lacking persistence was another feature of policy propaganda. These factors could work against public engagement in water issues and undermine the public’s understanding of and confidence in water management measures. We believe these results could help water resource managers to interpret media content of water issues and improve the propaganda of their policies, which would contribute to better administration of water resources.

Keywords: Content analysis; Mass media; People’s Daily; Policy propaganda; Water

Introduction

China is a massive country with a very large population and limited water resources. Its total water resource is one of the world’s largest, which ranks sixth globally. However, its water resource per capita is only approximately 2,000 m3, which is lower than a quarter of the world average value (Wang et al., 2008). With rapid economic development and climate change, China is faced with increasingly serious water problems, including water shortage, low efficiency of water use, excessive exploitation of...
groundwater, water pollution, water and soil loss, flood, and drought. All these problems are closely related to public life and interest.

The media have an impact on public debate, public opinion, and the public policy agenda (Hurlimann & Dolnicar, 2012). Studies have shown that being informed about water issues is associated with improvements in beneficial water behavior and attitudes, such as public acceptance of recycled (Lohman & Milliken, 1985; Tsagarakis & Georgantzis, 2003; Dolnicar et al., 2010) and desalinated water (Dolnicar & Schäfer, 2009; Dolnicar et al., 2011), and the promotion of water saving (Trumbo & O’Keefe, 2005; Dolnicar et al., 2012). Many regions around the world are grappling with water scarcity and quality issues, which are reported in the media and subsequently influence public perception and policy (Bloom, 1995; Newig et al., 2005; Hartley, 2006). Therefore, understanding the media coverage of water-related topics is critical.

Although media content analysis has matured in many fields, only a few studies to date have analyzed media coverage of water issues. Schmid et al. (2007) found that people were willing to protect water quality by examining public discourse themes in newspapers. Lyytimäki (2007) found that the Finnish press coverage of eutrophication focused on events rather than their long-term anthropogenic driving forces. Dolnicar et al. (2010) and Leong’s (2010) studies show that the public were influenced by the information presented to them about recycled and desalinated water. Campbell et al. (2011) studied the role of a local newspaper in a rural Australian community in the midst of an extended drought period and found that the paper tended to focus on positive stories. However, hardly any research focuses on the media coverage of water issues in China, even though this country is troubled by a serious water crisis. Thus far, the majority of studies are based on data collected over relatively short periods of months to years, whereas studies have shown that long-term monitoring of events can show the salience of events to the public (Scheufele, 1999). Considering all these situations, we conducted a longitudinal research of the media’s portrayal of water issues in China from 1950 to 2000 using content analysis.

The primary purposes of this study are to describe and quantify newspaper coverage provided to water issues, quantify and analyze the trend of media focus, and reveal the relationship between government policies and their news reports. The impact of mass media and characteristics of Chinese media are also discussed. In presenting our methods, we begin by providing a broader background of the utility of content analysis and then discuss more specific aspects of the content analysis approach applied. The results and discussion of our research methodology are then presented, including a section in which we further investigate central government documents and articles that mention these factors to uncover their connection. The conclusions section summarizes our findings and points out limitations in our study. We believe that our study can help resource managers to understand how the public receives information on water issues and the propaganda of their policies, which can improve their measures in water administration.

Role of mass media

Humans are living in a world full of words and images. Intending to write an immediate first draft of history, mass media richly describe current affairs (Bengston et al., 1999). Although media users interpret information provided to them by the media in different ways (Shoemaker & Reese, 1990), mass media can generally shape public conceptions of reality and consequently influence public attitudes and behavior (Jamieson & Campbell, 1992). Many studies have been conducted to confirm this standpoint. Hacking (2004) argued that a so-called ‘looping effect’ exists, which means that individuals may
change their behavior based on the predominant descriptions of the groups to which they belong. Soroka (2002) found that in the Canadian context, environmental issues were media driven. Thus, there are good reasons for conducting longitudinal studies of media representations when these social mechanisms are considered.

China is globally thought to be a place where citizens enjoy the least press freedom (Reporters Without Borders, 2007). The Chinese mass media are known to serve as the mouthpiece for the ruling party (Zhao, 1998). All Chinese media outlets are either directly or indirectly affiliated with governmental agencies and should abide by strict media content regulations (Zhao, 1998; Fu et al., 2012). However, since the Chinese Economic Reform in 1978, the media market in China has been undergoing a rapid transformation toward commercialization and market orientation (Fu et al., 2012).

Newspapers are an old line and central part of Chinese mass media, beginning long before the establishment of the People’s Republic of China. Although daily newspapers in many countries around the world have faced a steady decline in circulation and readership because of the advent of the Internet and its surrounding digital technologies, this industry in China has kept growing (Song & Chang, 2012). The yearly circulation of newspapers was 12,800 million in 1997 and increased to 43,800 million in 2007 (Cui & Zhang, 2009). A long history and large circulation make newspapers a good material to reflect China’s social concentrations in spite of governmental restrictions.

Materials and methods

Research period and newspaper

Longer periods of coverage provide a deeper understanding of public perceptions of water issues and allow a more thorough investigation of how the press covers water-related topics. Long-term monitoring of events can help to uncover how the public understands and responds to important issues affecting water. The People’s Republic of China was established in October 1949, but newspapers appeared and predominated over the media market long before that. However, the rapid development of digital media has decreased newspaper readership. Online Chinese newspapers appeared in 1995 (Liu, 2004), and nearly 1,000 online newspapers were already available in 1999 (Cui & Zhang, 2009). Online newspapers entered a new period after 2000 by having more unique content compared to paper editions (Liu, 2004). Thus, we examined newspaper representations of water issues from 1950 to 2000.

We checked all the newspapers on the top 10 circulation list in 2012 and found that only Reference News and the People’s Daily started in or before 1950. Given that Reference News focuses more on foreign politics, we finally selected the People’s Daily as our research material, which is considered China’s most influential and authoritative paper. It is considered as a ‘generative’ press that sets a frame of reference revered by other media organizations in China, as its editorials and commentaries are often obligingly relayed by all other media across the country. For major and sensitive affairs, this newspaper also sets the tone or the parameter of coverage within which other newspapers from the national to the local level have to follow carefully (Song & Chang, 2012). The People’s Daily provides electronic editions of its newspapers and some search functions, which improved our research efficiency significantly. Although we limited our investigation to one newspaper, we believe that this selection will not bias results substantially given that the People’s Daily has the second widest circulation in China.
Content analysis

Content analysis is commonly used for media analysis (Shoemaker & Reese, 1990). It is a methodological technique that enables researchers to systematically evaluate qualitative content in all communication forms; it typically uses pre-established procedures and coding schemes to classify or categorize the communication content by converting qualitative/textual data into a quantitative form (Weber, 1990; Wolfe et al., 1993; Krippendorff, 2004). Data patterns that emerge from content analysis can assist researchers to make sense of seemingly complex information in unstructured formats (Weber, 1990; Neuendorf, 2002; Krippendorff, 2004). While the technical details of content analysis may differ from one study to another, the basic methodological elements that most content analytic studies share include data collection, data coding, and analysis and result interpretation (Weber, 1990).

In content analysis, large quantities of data can be collected inexpensively in a much shorter time period compared to other direct observation methods such as interviews and questionnaires (Krippendorff, 2004). Therefore, researchers tend to leverage this strength and engage in extensive data collection for content analysis, which in turn makes the content analysis process time consuming and labor intensive (Sonpar & Golden-Biddle, 2008). Sampling, such as simple random sampling, systematic sampling, and stratified sampling, can help researchers to economize their content analysis efforts by decreasing the sample scale (Tangpong, 2011; Song & Chang, 2012). However, considering that certain water issues only receive little attention in newspapers, we searched all articles in our research period to avoid omission. Our major preparation and coding steps are shown in Figure 1.

The overall theme (i.e., the topic of water issues being reported) of each article was selected as the recording unit. The themes typically reside in the leading paragraphs of the reports to provide readers with the summary content of the news report (Tangpong, 2011). As a result, the collective document, which includes the headline and leading paragraph of each article, represented the recording unit to be content-analyzed. However, if the theme could not be determined from the headline and first paragraph, the entire article was analyzed. Overall, each article typically had one central theme (and thus one recording unit). However, as mentioned by Tangpong (2011), some articles may have more than one theme and each theme should be recorded. For example, a few news reports contained water issues involving different themes that took up similar proportions in the article. In these instances, all themes were content-analyzed and recorded individually.

The primary theme of the article was coded using seven categories, namely: economy, disasters, water environment protection, water saving, climate change, new water resources, and others. Water is an

![Fig. 1. Major preparation and coding steps.](https://iwaponline.com/wp/article-pdf/17/4/595/404952/017040595.pdf)
important element and restriction in the economy. Articles themed by the role of water in economic activities fell under the category of economy, such as water trading, irrigation, and recreation. Considering the duality of water, disasters were classified as another category. Other categories were based on the hotspots of water issues, except the last one, which was reserved for water-related articles fitted into other categories or unclear article types. Within the primary theme categories, economy (i.e., primary, secondary, and tertiary industries) and disasters (i.e., drought, flood, water shortage, water pollution, and others) were divided into subcategories. We identified articles based on keywords. A search was conducted on common terms and concepts that appeared in the People’s Daily. The relatively frequent terms and their synonyms were then selected to retrieve articles. A total of 70 keywords were used in this research (see Appendix).

Coding large volumes of digital textual data can be efficiently achieved via computers (Morris, 1994; Krippendorff, 2004). Software such as Nvivo can sharply improve coding efficiency. However, a fundamental difference exists between computers and humans in the way that computers recognize character strings, whereas humans can understand the meaning of text (Krippendorff, 2004). Scholars have long contended that important elements of arguments are often implied rather than explicitly shown in statements made within a text (Bitzer, 1959; Woodward & Denton, 2000). The role that computers with text-processing capabilities, such as search, retrieval, accumulation, word count, and keyword in context, should play in content analysis is aiding human coders rather than replacing them (Tangpong, 2011). Although computer tools were used to retrieve articles, the coding was conducted manually. The media signal the importance of certain issues by providing these issues with preferential treatment such as more frequent coverage and more prominent positions (Roznowski, 2003). Thus, our research mainly focused on the frequency counts of themes and article page numbers. A coder coded all the articles, whereas another independent coder assessed the coding reliability (Tangpong, 2011).

In content analysis research, the construct of interest is often measured through some form of frequency counts (Duriau et al., 2007). More reporting is not equal to more media attention because the total number of articles varies for every time unit. In our research period, the People’s Daily revised and expanded editions several times, causing sharp variations in annual article numbers. The largest annual article number (42,419, 1995) was more than three times larger than the smallest (9829, 1968). This variation may be ignored for a short-term study, but it should be considered in a longitudinal study where the research period extends to decades. We studied 50 papers, of which 96% did not consider this variation. The article number or other recorded units were the leading choice in frequency counts. Altaweel & Bone (2012) and Altaweel et al. (2010) used document frequency (DF) and inverse document frequency in the scoring of terms, which could eliminate this variation by introducing the total number of documents. DF is a common approach in feature selection, which stands for the frequency or relative frequency of documents containing certain terms (Zhang et al., 2005; Yang et al., 2010). In our approach, we modified the following form of DF (Sang & Wang, 2012) to make it suitable for content analysis:

\[
DF_c = \frac{d_c}{D} \times 100\% \tag{1}
\]

where \(D\) is the total number of documents and \(d_c\) represents the number of documents belonging to category \(c\). Similarly, front page ratio (FPR) was used to measure the importance of
water-related issues as follows:

\[ \text{FPR}_c = \frac{F_c}{d_c} \times 100\% \]  

(2)

where \( F_c \) is the document number belonging to category \( c \) and published on the front page.

Research on government policies

Content analysis cannot substitute for other methods, such as polls, surveys, and interviews, because it only describes message characteristics or reveals relationships among message characteristics (Neuen-dorf, 2002). However, it can be used in tandem with other methods to reveal deeper relationships between messages, senders, and receivers (Jick, 1979; Flynn et al., 1990). The government uses laws and regulations to guide and restrict public behavior to realize its policies. These documents are important in water resources management and water environment protection, as well as being closely related to the public interest. As a result, people should be informed of laws and regulations, which means that mass media have a responsibility to broadcast these documents.

We attempted to determine the relationship between central government documents and their news reports in the People’s Daily to understand the propaganda of government policies. Table 1 shows the compositions of central government documents in this research. Local laws and regulations were not included. We obtained data from the Chinese laws and regulations retrieval system (http://law.npc.gov.cn/home/begin1.cbs). Given that dramatic variations in the number of central government documents per year were observed, we also used DF as a measurement.

Results and discussion

Longitudinal distribution trend

Approximately 25,788 water-related articles were retrieved in this study. During our research period, the average DF of water-related articles was 1.92%. As shown in Figure 2, the DF first increased from 1950 to 1959, and then saw a sharp decrease from 1960 to 1967. After a slight increase from 1968 to 1972, the DF of water-related articles showed a flat trend except in 1998.

Two significant peaks happened in 1959 (4.12%) and 1998 (3.42%), and the minimum value appeared in 1967 (0.44%). The first significant peak (1959) happened during the Great Leap Forward and Three Years of Natural Disasters. The Great Leap Forward was an economic and social campaign from 1958 to 1960, which attempted to rapidly transform the country from an agrarian economy into a communist

<table>
<thead>
<tr>
<th>Table 1. Compositions of central government documents.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Laws and decisions of relevant issues (L)</td>
</tr>
<tr>
<td>Regulations and relevant documents (RE)</td>
</tr>
<tr>
<td>Rules and relevant documents (RU)</td>
</tr>
</tbody>
</table>
society through rapid industrialization and collectivization. The Three Years of Natural Disasters, which is also known as Three Years of Great Chinese Famine, was the period in the People’s Republic of China between the years 1959 and 1961 characterized by widespread famine. Consequently, 78% of water-related articles were about the economy, and nearly 34% of water-related articles were focused on disasters. Articles about drought always allotted significant proportions to describing its impact on agriculture, which belongs to the subcategory of the economy. Another significant peak showed in 1998. Disaster articles took up 64% of the water-related articles this year, and nearly 90% of them focused on flood. Major floods happened in 1998. Flood stricken areas/crop-sown areas took up 14.32% in that year, whereas the average level of this group was only 6.30% from 1952 to 2000. Theory suggests that more opportunity for media attention and impact on public opinion exist for issues that involve dramatic events that are domestically relevant (Wanta & Hu, 1993; Soroka, 2002). This observation explains why disasters dominated water-related articles in some years because disasters are not only directly experienced by the public but are also dramatic events with high domestic relevance.

The minimum value appeared in 1967, which is the second year of the Cultural Revolution. The Cultural Revolution was a social-political movement that lasted for more than 10 years and significantly affected the country economically and socially. The total number of articles per year during the Cultural Revolution was 50% less than the average value in our research period. The socio-political movement was also the focus of mass media. Headlines of news reports always started with the words of Chairman Mao during the Cultural Revolution.

Page number

Giving certain issues more prominent positions can signal their significance. Editorial theory states that the front page is superior to other pages and should contain the most important information (Zheng, 1995). A research made by the People’s Daily shows that people focus more on the front page than other pages (Wu, 2000). The front page can influence a reader’s estimation of the total content of the paper, which has an impact on newspaper circulation. Ying (2012) interviewed newspaper readers and found that the front page could affect their choice of newspapers.
We used FPR to measure the importance of water-related issues. We can observe from Figure 3 that during our 50-year research period, the FPRs of water-related articles were higher than for other articles in 38 years. This result means that the People’s Daily put more significance on water issues than others in most years. From 1966 to 1976 during the Cultural Revolution, the FPRs of water-related articles were higher than the mean value in only 2 years. We can conclude that water issues obtained less attention in this period, which showed lower DF and FPR values. The average page number of water-related articles was always lower than that of all articles except in 1974 and 1975 (Figure 4), which indicates that water issues were reported in front of many other topics. Other research obtained similar findings. Rosegrant (1997) found that water had been at the forefront of much global and local media coverage as pressing issues revolving around human health, climate change, agriculture, pollution, and biodiversity had water as a central component.

**Content composition**

The majority of water-related articles published were focused on the economy (16,525), followed by disasters (6,673) and water environment protection (2,085). Certain water issues were not frequently

---

**Fig. 3.** FPR from 1950 to 2000.

**Fig. 4.** Average page number from 1950 to 2000.
covered. For example, water saving, new water resources, and climate change only received coverage in 429, 219, and 60 articles, respectively. A total number of 2,162 water-related articles also fitted into other categories or their article types were unclear, such as territorial waters disputes, introduction of certain rivers, and attempting to find water on Mars.

The top three categories’ longitudinal distribution is shown in Figure 5. The DF of the economy had a similar trend with that of all water-related articles. After drastic fluctuations during the early years, it showed a flat trend after 1975. The DF of water environment protection kept increasing, whereas fluctuations were always observed for disasters.

Primary industry was the predominant composition of the economy in the early years of the People’s Republic of China. However, a clear decreasing trend was observed from the 1960s, except for a rise from 1967 to 1971. It fell to second place in 1980 and finally became the smallest fraction in 1984. Secondary industry also experienced sharp changes in the early years and began to flatten after entering the 1970s. Tertiary industry showed a generally increasing trend and became the leading composition in 1984 (Figure 6). Articles focused on water’s recreation function comprised 74% of water-related articles.

Fig. 5. DF of the top three categories.

Fig. 6. DF of three industry types.
themed by tertiary industry. Its longitudinal distribution is shown in Figure 7. We computed Mann-Kendall tests on water-related articles belonging to recreation to determine whether mutation points exist in series. A mutation point was observed in 1982 using a 5% significance level. The average DF of water’s recreation function per year was 0.18% from 1950 to 1981, which increased to 0.38% after the mutation point (1982–2000).

Water environment protection was another focus of our study. The reporting of environmental issues in public media helps to form people’s perceptions about their surrounding environment (Lomborg, 2001; Boykoff, 2009). As mentioned above, an increasing trend can be found in this category, especially after 1995 (Figure 8). We also carried out Mann-Kendall tests on water-related articles themed by water environment protection and found a mutation point in 1985 using a 5% significance level. The average DF of this category per year was 0.08% from 1950 to 1984, and it increased to 0.24% after the mutation point (1985–2000).

![Fig. 7. DF of water's recreation function.](image1)

![Fig. 8. DF of water environment protection.](image2)
We also searched the media focus of water environment protection, including water and soil conservation (WSC), water pollution control (WPC), aquatic organism protection (AOP), ecological economy (EE), environmental improvement of human settlement, returning farmland to lake, establishment of nature reserves, and others. We selected years at 10-year intervals. The results show that WSC was always an important part of water environment protection (Figure 9), which can be accepted easily because 70% of China’s land is covered by hills (Tang, 2004). Natural factors and abuse of resources caused serious water and soil losses. China conducted many studies and engineering measures during our research period to control water and soil losses, such as testing area construction, small watershed treatment, and city WSC (Yang et al., 2006). WPC was another important grouping. Figure 9 shows that WPC became the dominant focus in 1971. Economic growth often has a serious impact on the environment, and China is no exception. Serious water pollution has drawn public attention. Many laws, regulations, and engineering measures have been implemented to control water pollution in our research period (Chen, 2012). Figure 9 also shows a growing diversity in media focus on water environment protection. As time progressed, EE, AOP, nature reserves, and human settlement started to obtain more attention.

The mutation points of recreation and water environment protection both happened in the 1980s. However, the explanatory factors cannot be pinpointed by content analysis. These mutations could be the result of the Chinese Economic Reform, which is also known as the Reform and Opening-up Policy. It was started in December 1978 and attempted to liberate and develop productivity, as well
as emancipate the mind. China’s economy experienced one of the world’s largest booms after this reform. The rapid increase in economy and freedom of thought could contribute to the growing concentration of recreation and water environment protection.

Policy propaganda

Although the media has a responsibility to broadcast government policies, we could not determine a clear relationship between central government documents and their reports (Figure 10), except the DF of central government documents was always much higher than that of water issues. We selected certain documents promulgated from 1950 to 2000 and searched news reports that mentioned them in the People’s Daily to further research into this problem. We chose four aspects to reflect the development, utilization, and protection of water resources: the Three Gorges project (TGP), water withdraw permit (WWP), flood control (FC), and WSC. Articles which mentioned these documents within 5 years since their promulgation were calculated (Table 2).

We found 21 central government documents in this period that contained three laws and decisions of relevant issues (Ls), five regulations and relevant documents (REs), and 13 rules and relevant documents (RUs). The results show that the propaganda lacked persistence. The leading propaganda happened in the first year since the promulgation, containing 43% of the articles included in the sample. It then rapidly dropped to 19% in the second year followed by 12% in the third year, 14% in the fourth year, and 12% in the fifth year. More consistent information release to the public can help to ensure awareness of how water issues can impact public life (Wilde, 1993). Thus, improving the reporting persistence of water-related policies is required.

Large differences in the propaganda of different central government document types were observed. The dominant type was L, which on average obtained 49 reports in 5 years per document. The next major type was RE, which on average obtained nine reports in 5 years per document. RU only received 0.08 articles in 5 years per document, which indicates that RU always obtained no report in the People’s Daily. However, the composition of central government documents was different from the propaganda

![Fig. 10. DF of water-related articles and central government documents.](https://iwaponline.com/wp/article-pdf/17/4/595/404952/017040595.pdf)
condition. Among the 320 central government documents we found, 77% were RUs, while Ls only took up 8%. Although ministries and commissions publicized RUs on their own websites, the influence was far from a nationwide newspaper with a large circulation. Similar situations exist in other fields and have led to serious problems. Chen & Wei (2006) found that the lack of law and regulation propaganda was a reason for accidents in the mining industry. Nearly 50% of illegal activities in the tobacco industry were caused by ignorance of laws and regulations (Chen et al., 2003).

Table 2. Central government documents and their news reports.

<table>
<thead>
<tr>
<th>Focus</th>
<th>Title</th>
<th>Type</th>
<th>Year of issue</th>
<th>1a</th>
<th>2a</th>
<th>3a</th>
<th>4a</th>
<th>5a</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>TGP</td>
<td>Decision on the construction of the TGP made on the fifth session of the Seventh National People’s Congress</td>
<td>L</td>
<td>1992</td>
<td>20</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Regulations on residents-resettlement for the Yangtze River TGP construction</td>
<td>RE</td>
<td>1993</td>
<td>6</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Water traffic safety management approach during the construction period of the TGP first-stage project</td>
<td>RU</td>
<td>1994</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Supplemental provisions for accounting system of TGP residents-resettlement fund</td>
<td>RU</td>
<td>1999</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>WWP</td>
<td>Regulations on the implementation of WWP system</td>
<td>RE</td>
<td>1993</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Provisions for examination and approval procedure of WWP licenses</td>
<td>RU</td>
<td>1994</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>FC</td>
<td>Interim procedures for catastrophic floods and droughts control subsidies use management</td>
<td>RU</td>
<td>1997</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>FC law of the People’s Republic of China</td>
<td>L</td>
<td>1997</td>
<td>17</td>
<td>20</td>
<td>13</td>
<td>14</td>
<td>9</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Project management approach for FC and annual repairs fund at the central level</td>
<td>RU</td>
<td>1997</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Procedures for catastrophic floods and droughts control subsidies use management</td>
<td>RU</td>
<td>1999</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Interim procedures for compensation of flood storage and detention areas’ utilization</td>
<td>RE</td>
<td>2000</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>WSC</td>
<td>Act of WSC</td>
<td>RE</td>
<td>1982</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Provisions for WSC in the adjacent area of Jin-Shan-Meng</td>
<td>RU</td>
<td>1988</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>WSC law of the People’s Republic of China</td>
<td>L</td>
<td>1991</td>
<td>21</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Enforcement regulations on the WSC law of the People’s Republic of China</td>
<td>RE</td>
<td>1993</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Provisions for credentials of making WSC schemes of development and construction projects</td>
<td>RU</td>
<td>1995</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Provisions for examination and approval of WSC scheme applications of development and construction projects</td>
<td>RU</td>
<td>1995</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Trial procedures for major WSC projects management in soil loss area at the middle and upper reaches of the Yellow River</td>
<td>RU</td>
<td>1997</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Notice of enforcing WSC in non-ferrous metal production and construction projects</td>
<td>RU</td>
<td>1999</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Provisions for WSC environment monitoring network</td>
<td>RU</td>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

`Number of years since the document was issued.`
Conclusions

Confronted with climate change and population growth, water resources management is facing significant challenges globally. Mass media can shape public conceptions of reality and influence attitudes and behavior. Thus, we presented a set of methodologies that could provide a deeper understanding of how water issues were covered in the People’s Daily, which has the second largest circulation in China, and the relationship between government policies and their reports.

Given the results of this study, after several drastic fluctuations in the early years of the People’s Republic of China, the DF of water-related articles showed a flat trend. However, disasters could cause sharp increases in the DF. Water issues were given importance by the media because water-related articles obtained more front pages than average. Economy, disasters, and water environment protection were the leading content compositions of water-related articles. The People’s Daily has started to focus more on the recreation function and protection of water since the 1980s. The media focus on water environment protection also showed a growing diversified tendency.

Evidence from this study indicates that the newspaper coverage of water issues was characterized by a lack of inclusion of government policies, which was shown by insufficient news reports of certain central government document types and reporting persistence. Consistent reporting on all water-related central government document types can ensure that the public are well aware of their rights and obligations in water issues. As a result, these insufficiencies could theoretically harm the government’s work in promoting public participation in the future of water. Given the role of media in influencing people’s perceptions on water issues, these results suggest that resource managers need more effort in propagandizing water-related policies.

Our study has some limitations. First, these results can only be generalized to one newspaper under investigation and not necessarily to other newspapers and media outfits such as television, radio, or the Internet. Single-media studies, by nature, may not be as rich as cross-media studies (Roznowski, 2003). Future research can examine the coverage of other newspapers and media. Second, our research only focused on frequency counts of themes and page numbers because of labor limitations. Other factors such as article type, tone, and primary commenter can be included in future research. Third, the research period could be extended to the 21st century to help people understand recent conditions in the media coverage of water issues. Besides, text-processing software should be used to accelerate coding work in future research.

Acknowledgements

This research is supported by the National Natural Science Foundation of China (91125018, 91125007 and 51479089), ‘Twelfth Five-year’ Science and Technology Support Program (2013BAB05B03), Public Welfare Program of China’s Ministry of Water Resources (201401031), and Excellent State Key Laboratory Program (51323014).

References


Received 19 June 2014; accepted in revised form 25 November 2014. Available online 26 December 2014

**Appendix: Keywords used in the research**

Water, irrigation, hydropower, hydroelectricity, hydropower station, hydroelectric station, reservoir, shipping, channel, water transport, dam, dike, fish, fishery, aquatic product, drinking, domestic water, drought, protection against drought, fight a drought, dry damage, flood, flood control, fight a flood, flood diversion, flood peak, flood prevention, flood season, inundation, high water, waterlogging, drainage, drain flooded fields, ponding, water quality, water pollution, water contamination, eutrophication, water shortage, water saving, water conservation, water recycling, recycled water, wastewater recycling, sewage, waste water, desalination, seawater desalination, storm water, rain, climate change, water ecology, water ecosystem, water environment, aquatic organism, habitat, ecological operation, environmental flow, bridge, river, lake, water and soil conservation, water and soil loss, water conservancy, swimming, diving, rowing, canoeing, skiing, sailing.