Title: Constraining Risk Narratives: A Multidecadal Media Analysis of Drinking Water Insecurity in Bangladesh

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1   Title: Constraining risk narratives: a multi-decadal media analysis of drinking water

2   insecurity in Bangladesh

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32 Abstract

33 Sustainable development agendas in Bangladesh are frequently framed in the media as being

34 constrained by water insecurity and the decision-making challenges posed by multiple risks of

35 both natural and human origins. This paper suggests, however, that the reverse also occurs: the

36 boundaries of risk narratives constructed by the media serve to mitigate public concerns,

37 reinforce national development agendas, and legitimize structural changes of the dominant

38 institutions. These relationships are explored through a set of risk-discourse filters which merge

39 content analysis approaches with the defining phenomena of risk society theory. Advancing an

40 inventory of 3,211 drinking water specific articles published by the Ittefaq newspaper between

41 1980 and 2016, the analysis identifies three temporal clusters of discursive behaviors and content

42 focus which contribute an historic perspective of how Bengali newspapers construct, define, and

43 react to multiple water safety crises, specifically cholera and arsenic. The risk-discourse filters

44 suggest that the media's problematization of drinking water remains aligned to nation-building

45 processes and the political narratives of development successes defined by international targets.

46 The results map the discursive distribution of concerns across geographies and risk positions,

47 extending interpretations of how and where blame is allocated. The inventory reveals an

48 identifiable temporal and content pattern of inclusion and exclusion of topics and draws links to

49 the overall institutional dynamics of political and economic change.

50 Keywords: *Arsenic; Bangladesh; Media; Risk; Water Security*

1. Introduction

In Bangladesh, the national narrative around sustainable development is often distinguished by the collective challenges to manage water variability, maintain service reliability, and reduce safety uncertainties (Paprocki 2018; Black 1990; *The Economist* 2018; van Geen 2008). Global forums of scientific discourse frequently characterize Bangladesh as one of the world's most water insecure nations, a portrayal emerging from a complex confluence of both environmental hazards and unintended consequences of anthropogenic actions (Smith, Lignas, and Rahman 2000; van Geen 2008; Sultana 2012). At the same time, domestic forums of public policy seek to portray Bangladesh as a successful nationalist project, with the state protecting population from environmental dangers and enabling ongoing innovation in development approaches relevant to national and global interests (Faaland and Parkinson 1976; Hossain 2017). These narratives represent a tension between the competing voices contributing to the construction and interpretation of publicly debated drinking water risks. However, it also raises the question of how the public narratives incorporate and mediate the contestation of different spheres of Bangladeshi and international institutions, interests, and information systems.

Bangladesh is located in one of the most densely populated and engineered deltaic plains in the world, a complex physical environment of rivers and man-made canals situated in the foothills of the Himalayas. Academic studies characterize the country by the high levels of climatic variability due to the annual monsoon cycles from the Bay of Bengal (NIPORT 2013). Scientists and experts often contextualize their research as a response to the severity and estimated scale of the depicted environmental crises, from some of the comparatively high global maternal and infant mortality rates in the 1970s related to cholera outbreaks to the public acknowledgement of arsenic contamination in the 1990s (Smith, Lignas, and Rahman 2000; Black 1990). The

74 discovery of naturally occurring arsenic in the shallow aquifer levels attracted international

75 attention to the uncertainty around who is at-risk, a scale estimated to be in the tens-of-millions

76 and defined by the specific threshold levels applied (Johnston and Sarker 2007). The extensive

77 technocratic focus emerged from what Hossain(2017) argues is the global role of Bangladesh as

78 an aid laboratory of national experimental policy, one which is characterized as repeatedly

79 achieving multiple development and innovation successes.

80 International newspapers have provided an external voice to legitimize and disseminate these

81 technical concerns. The widely cited 1998 New York Times article's description of arsenic

82 contamination shocked the world with its severe portrayal of the situation by stating:

83 "Bangladesh is in the midst of what some experts say could be the biggest mass poisoning in

84 history"(Bearak 1998). Prior to 1971 national independence, water resources were characterized

85 as a source of prosperity and fertility, an element of the romanticized national cultural identity

86 labeled *Sonar Bengal,* or Golden Bangladesh (Hossain 2017; Hanchett et al. 2014). Hossain

87 argues the national narrative around water security was re-framed after independence as a

88 controllable danger, one which the new state pledged to manage. This reframing connects to

89 what Black(1990) argues is the state's dual commitment to rural constituents and international

90 aid structures seeking to solve a problem, specifically to reduce infant mortality blamed on

91 cholera epidemics and unsafe water systems. The positive and negative framing suggests a

92 divergence of how water is problematized between overlapping national development narratives,

93 one advancing a positive social and political interpretation of water as critical to the nation's

94 social and political development, and the other issuing techno-scientific warnings of increasing

95 exposure to harm and future dangers.

96   Within the continuum of theories on the nature and definition of risk, this paper explores theories

97   that risks are negotiated through individual and collective processes reconciling definitions,

98   reproducing awareness, disseminating a specific portrayal of past decisions, and constructing

99   future dangers (Beck 2009; Luhmann 1990; Lupton 1999; Beck 1992). Beck defines risks as

100 potentially catastrophic, manufactured uncertainties which are socially constructed, socio-

101 technically contested, and socio-politically criticized across institutional and discursive dynamics

102 (Beck 1992; Simon Cottle 1998). This view is predicated on the argument that the concerns,

103 specifically drinking water in this paper, are a neutral concept until a group or population attach

104 technical, political, cultural filters to denote 'good' and 'bad' attributes, or decisions (Ewald

105 1991; Douglas 1992). This rendering process necessitates mechanisms to make risks imaginable

106 as they are not experienced (Beck 1992, 28). This occurs across multiple discourse fragments,

107 bodies of texts, and from multiple discursive planes, or institutional locations from which the

108 discourse happens (Wodak 2001).

109 Despite a broad consensus around the discursive role in manufacturing risk, communication

110 studies scholars have identified gaps in the methodological toolkits and definitional frameworks

111 for comparable analysis. Specifically, Bakir(2010) identifies the need for comparable macro-

112 view longitudinal studies across multiple socio-spatial contexts to interrogate the historic

113 evolution and construction processes. Further, Kristiansen(2017) documents that recent

114 scholarship varies in their definitional understandings rendering empirical methods

115 incomparable, limiting analysis across spatial contexts and concerns.

116 This paper therefore seeks to understand not only how, but also why, the media renders certain

117 risks visible and knowable. This builds from Beck's risk theories to design a replicable approach

118 for future multi-context comparisons using nuanced risk-discourse filters to identify the factors

119   influencing the construction and constraints of the public narrative. To do this, the paper attempts

120   to understand how Bangladesh's drinking water narratives evolved within newspapers texts and

121   how discursive tools were deployed to delineate, categorize and exert control over this formation

122   process. This has implications for the allocation of risk responsibility across multiple actors and

123   shaping expectations for collective and private actions to mitigate uncertainty and insecurity.

124   2.   Manufacturing risk: A merged framework

125   The following sections propose a framework which merges two broad areas of academic inquiry:

126   the features defined within Beck's(1992) theories of risk society, and the discursive filters

127   employed within communication studies, specifically by Herman and Chomsky(1988).

128   2.1. Media and discursive analysis framework

129   Building from critical discourse analysis approaches which provide tools to locate discourse

130   within the broader socio-cultural context, this study narrows in on methods used by

131   communication and media studies scholars to understand how various themes are located within

132   multiple discourse fragments, ranging from formal government policies to techno-scientific

133   papers to print news to audio-visual content to new online social media. These inventory and

134   article coding tools enable comparative analysis of how the public agenda setting processes

135   respond to or are shaped by institutional priorities (Entman 1993; Painter, Kristiansen, and

136   Schäfer 2018). Media studies have focused on what Bakir(2010) described as four key

137   approaches: events, framing, newsworthy, and biases. This paper seeks to expand these content

138   analysis methods into a systematic framework to delineate the context, formation, and

139   contestation of the dominant narratives.

140   Herman and Chomsky(1988) used critical discourse analysis techniques in the 1980s to generate

141   a critique of media performance. Building on Lippmann's(1922) influential observations that

142   media discourse is used as a tool to manufacture various forms of social and public consent,

143   Herman and Chomsky argue that the media serves a specific societal purpose of "inculcating and

144   defending the economic, social and political agenda of privileged groups that dominate the

145   domestic society and the state"(Herman and Chomsky 1988, 298). Their critique in the late

146   1980s, known as the "Propaganda Model", provided a sharp contrast to the prevailing American

147   liberal-pluralists view of media as guardians of "public interests and watchdog on the exercise of

148   power" (Mullen 2010). This paper acknowledges the relevance of this work for broader political

149   critiques but seeks a different application of their work, focused instead on how the structural

150   elements are utilized to construct risk narratives in a very different institutional context of

151   Bangladesh.

152   Herman and Chomsky based their work on the assumption that the mass media serves as a

153   "system for communicating messages and symbols to the general populace…that inculcates

154   individuals with values, beliefs and codes of behaviors that will integrate them into the

155   institutional structures of the larger society"(Herman and Chomsky 1988, 1). To that end, their

156   model proposes five main strategies and practices of the mass media: ownership structures,

157   financial revenue sources, bias towards dominant sources of information, flak or negative push

158   back, and use of fear as a control mechanism (Mullen 2010).

159   This paper builds from the range of structural and discursive tools used to analyze the media.

160   They include the frequency and selection of topics; the length and detail provided to a story; the

161   position and framing of articles within the overall presentation of news; the use of external

162   citations to legitimate concerns; role of experts to filter information; the emphasis and tone to

163 build trust or moderate interest in a topic; and the articles discursive allocation of responsibility

164 and interpretation of action (Herman and Chomsky 1988, 298).

165 This paper explores the alignment between components of risk theory and media analysis tools.

166 The alignment of these approaches is summarized later in Table 2 and used to define the coding

167 methods for the newspaper inventory.

168 ## 2.2. Defining components of risk society

169 This paper's analysis is situated within the process which Beck (1992) described as a dynamic

170 competition of rationalities between the organs of public life. Beck, along with other scholars,

171 has argued that public media discourse has historically been a dominant voice defining and

172 propagating risks perceptions (Dean 1999; Anderson 2006; Beck 2006b; Simon Cottle 1998).

173 Beck argued that the risk definition process has the power to influence the macro-evolution of

174 modernization, as well as socio-economic and political development (Beck 1992, 56). Beck

175 further explains the rationality of the techno-scientific approach, which quantifies uncertainty

176 using probabilistic estimates, as a form of future-making that results in controllable and

177 distributable forms of risk imaginaries. Although quantified in language of probabilistic hazards,

178 vulnerabilities and exposures, he argues that most risks remain invisible in the public

179 consciousness until negotiated within a process of collective knowledge production and public

180 legitimization (Beck 1992, 71).

181 Beck's theories were criticized for not providing empirical or replicable methods explaining the

182 risk formation process within public discourse (Mythen 2005; Simon Cottle 1998). A series of

183 recent articles have sought to address an element of this gap by merging media studies methods

184 with multiple risk theories, although largely focusing on the thematic topic of global climate

185 change and nuclear power (Painter, Kristiansen, and Schäfer 2018; Adger et al. 2001). Several

186 papers, specifically Cottle(2014) and Anderson(2006) extend Beck's analytic framework to

187 deconstruct the discursive process of risk production, while others like McEvoy and

188 Wilders(2012) offer empirical studies. Although these papers offer important interpretive

189 analysis, they have not generated replicable tools for longitudinal assessments.

190 Building from previous papers application of Beck's risk features to the construction of public

191 narratives, this paper identifies the following core features from Beck's theories to be integrated

192 into discourse analysis frameworks (Beck 1992; Beck 1995; Beck 2006b; Beck 2013)

193   • the production and controllability of uncertainties;

194   • the winners and losers of which topics are identified and debated within risk narratives;

195   • the definition of safety thresholds and process to secure social acceptability;

196   • the technical representation and calculability of risks;

197   • the dependence on experts for legitimization;

198   • the distributions of "goods' and 'bads';

199   • the allocation of blame and responsibility;

200   • the recognition or self-confrontation of unintended, or latent side-effects of technological

201   and social innovations.

202 While this paper uses Beck's original work as its foundational structure, there are several

203 limitations, summarized by Mythen(2007, 799), to address. This paper does not assume

204 uniformity of risk experiences or behavioral responses when using the term public, and it does

205 not seek to explain individual or collective actions. Instead, the paper seeks to understand the

206 strategies used by the media to select and organize the central ideas problematizing drinking

207 water concerns (Dean 1999; Entman 1993; Nisbet and Mooney 2007). The second acknowledges

208 the limitations of Beck's primary focus on the "icons of destruction," including nuclear war,

209 climate change, genetic manipulation, and environmental ecosystem collapses. However,

210 following from Allan(1999), this paper extends the application beyond Beck's originally defined

211 catastrophic risks into the drinking water sector. By doing this, the paper argues the growing

212 utility of social theory for interpreting the politics mediating knowledge production and

213 rendering awareness of "new risks" informed by science, negotiated culturally, and filtered

214 through changing national and international political economies.

215 ## 3. Media inventory

216 ### 3.1. Media context in Bangladesh

217 Following independence from Pakistan in 1971, the media industry maintained an important role

218 in national development and state legitimization (vom Busch and Carthew 2008; Mahmud 2013).

219 For nearly twenty years after independence the media remained under direct, and indirect, forms

220 of government control, which include censorship of content, monopoly over information, control

221 of revenue, and restricting printing press supplies. By the early 1990s, a political consensus

222 between major parties removed these direct controls to enable more freedoms of press and entry

223 of new publishers and titles into the media market (Mahmud 2013, 40). These changes reflect

224 incentives of political parties to direct campaign messages and market opportunities to expand

225 readership through the growing educated middle-class urban population.

226 The shifts in the political patronage and increased readership encouraged private investment in

227 media sector. The printed newspaper industry grew from the four government-approved papers

228 in the mid-1970s to over 300 daily newspapers in the late 1990s. By the mid-2000s there were

229 over 1800 newspapers and periodicals published in the country, 90percent of which were also in
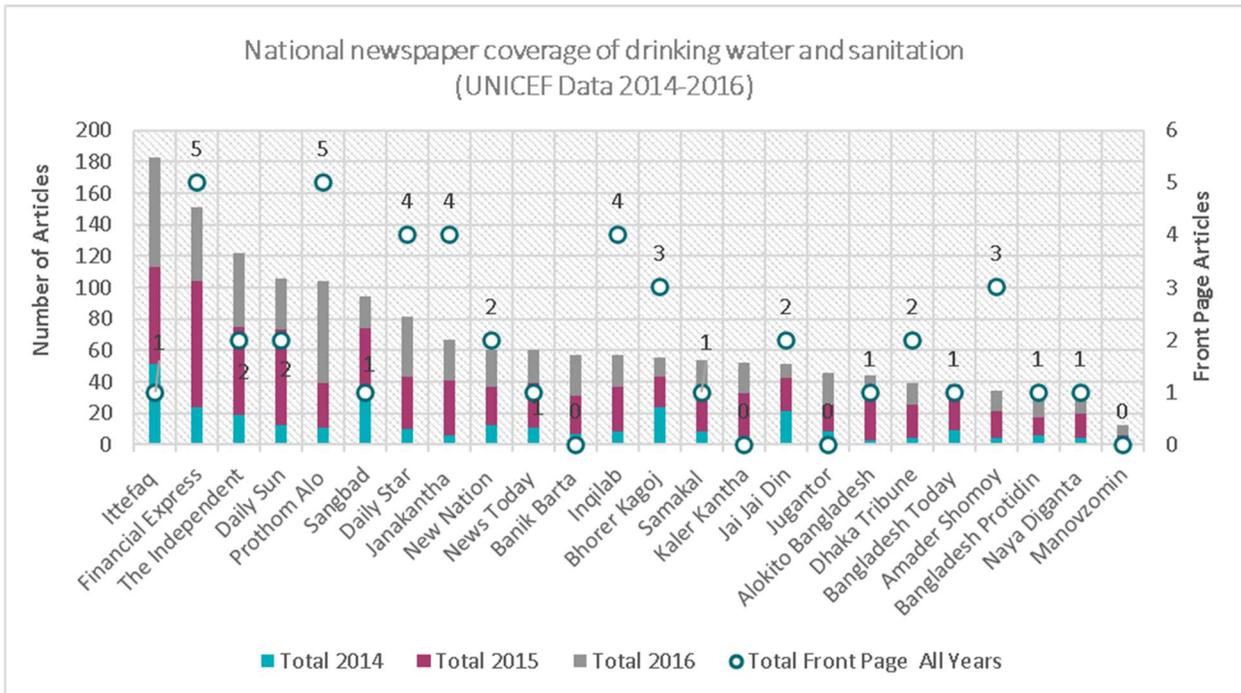
Figure 1 Summary of 29 national Bangladeshi newspapers coverage of water, sanitation and hygiene topics from 2014-2016. Data provided by UNICEF-Bangladesh.

230   Bengali (vom Busch and Carthew 2008, 11). The daily print newspapers were competing with a

231   rapidly growing media market of television, radio, and internet. Despite these changes,

232   newspapers remain politically influential medium for public discourse, continuing to advance

233   national debates and business priorities (Chowdhury 2017).

234   The heterogeneity of newspapers brought differences in coverage and thematic focus of reporting

235   on drinking water themes. As seen in Figure 1, the United Nations Children's Fund(UNICEF)

236   provided their daily media inventory, which offered a pre-filtered inventory of twenty-nine

237   newspapers reporting on water, sanitation and hygiene(WASH) between 2014 and 2016. This

238   inventory was compiled by E-Media, a consulting firm in Dhaka, using a daily keyword search

239   to identify all articles pertaining to domestic/drinking water, sanitation, and hygiene. As this was

240   compiled by an outside firm without the researcher's involvement, the results provide a snapshot

241 of the trends and key issues in the daily news cycle but are not useful for detailed analysis. This

242 UNICEF data guides the selection of which newspaper to inventory for this study.

243 The media clips show an uneven distribution of articles published by different newspapers,

244 suggesting divergent interests and editorial priorities across the major Bangladeshi newspapers.

245 In aggregate, the Ittefaq(total:183) published the largest number of WASH-related articles,

246 followed by the Financial Express(total:151) and the Independent(total:122). Two of these

247 papers are English-language publications, implying a specific target audience of business,

248 international, and educated readers. In comparison, the Prothom Alo newspaper, identified as

249 having the largest circulation as of 2011 (Mahmud 2013, 45), reported 104 WASH-related

250 articles. The UNICEF media inventory suggests that WASH topics are not covered equally

251 across newspaper titles, neither in total number of articles published per year or amount of

252 frontpage stories. The range of coverage contextualizes later analysis and acknowledges the

253 limits of the Ittefaq as just one perspective within the broader social discourse.

254   3.2. Newspaper selection

255 The Ittefaq newspaper was selected for further analysis due to its prominent role as one of the

256 oldest, continually published, and politically relevant Bangla-language news sources in

257 Bangladesh (Chowdhury 2017). The paper had a reported circulation of 135,350 daily readers in

258 2011 (Mahmud 2013, 45). It remains a privately-owned newspaper, first published in 1952 by a

259 prominent and founding member of the Awami League, one of the main Bangladeshi political

260 parties. The paper served as a prominent voice in opposition to Pakistani rule, demanding

261 regional autonomy which led to the 1971 attack by Pakistani military on the newspaper's

262 headquarters in Dhaka. As a result, the newspaper became a symbol for the nationalist

263 movement, a sentiment which remains a defining feature of the newspaper today (Chowdhury

pg. 14

264 2017). As a daily newspaper it remains an influential source of news and editorials, partly aided

265 by its historic symbolism and continued perception of political neutrality relative to other papers.

266   3.3. Inventory methods

267 The methods for this paper seek to build a longitudinal inventory of newspaper articles to track

268 the evolution of a specific discourse fragment using a content analysis framework described in

269 section 2.1 and summarized in Table 2.

270 Every hard-copy edition published between 1980 and 2016 was reviewed to identify every article

271 containing references to "drinking water" or water and specific health outcomes of water

272 insecurity including "cholera," "diarrhea," and "arsenic" in the title, byline or text. Bengali

273 drinking water-related vocabulary inventory was provided by Hanchett et al (2014) and included,

274 but was not limited to, the Bangla words: *khabar pani* or drinking water; *panir sorboraho* or

275 water supply; *dushito pani* or polluted water; *pani bishuddho* or clear water; and *panir songkot*

276 or water crisis.

277 The data entry was structured using pre-set choice and integer questions, and then administered

278 in an electronic form using the mobile data entry platform ONA for uploading, editing, and

279 viewing submitted forms. In addition to a literature review on coding design, the form was

280 reviewed by Bangladeshi and international domain experts.

281 After identifying articles discussing drinking water in the daily newspapers, the coder entered

282 key information including title, date published, position in the newspaper, specific geographic

283 identifiers at divisional scale, and keywords. Each article was coded using a pre-defined list of

284 keywords, with a text options for any unusual or atypical "other" key words. The thematic

285 keywords, 30 in total and fully listed in Table 1, were clustered in thematic categories: physical

286   infrastructure, water quality, functionality and reliability, management and administration,

287   environment and climate, and health outcomes. After reading the article and photographing the

288   text, when permitted by the library, the first reviewer, a research assistant from University of

289   Dhaka, selected all key words (AKW) referenced within the text. This was followed by the same

290   reviewer selecting the main key word (MKW) based on their assessment of the primary subject

291   of the total article text, across both the title and the story body. The English translations of the

292   title were coded based on the primary subject of the title text (TKW) by a separate reviewer who

293   was unfamiliar with the full text of the article.

294   A subset of the identified Ittefaq articles, 1,507 of 3,211 (46percent of the total), were randomly

295   selected from a list of each month's identified articles for further coding using discrete questions.

296   The additional coding included the following categories: specific reference to vulnerable groups

297   including women, children and the "poor"; citations to information and data; citations of expert

298   opinion or knowledge; article text directly assigning responsibility to specific actors to address

299   the problem; and text assigning or reporting actions taken in response to problem or topic.

300   The archival research was conducted between mid-January and October 2017 by a graduate

301   student at the University of Dhaka who was trained on the coding methods. Archival work

302   represented over 160 person-days in the public libraries, translation, and data cleaning.

303   Intercoder reliability was tested after three weeks by a second trained native Bengali-speaking

304   staff member, and a further random sample after three months. The intracoder reliability was

305   tested at two points, after three weeks and a random sample at the end of the study, showing

306   84percent reliability of main key words. All title translations were checked by main researcher

307   for English-language coherency.

3.4. Data limitations

308

309   The process of cataloging the Ittefaq articles presented several challenges, the costliest being the

310   absence of digital archives and restrictions on the number hard-copy editions that could be

311   accessed each week. Although originally intended to begin in 1971, the costs and time restricted

312   the inventory to the years 1980-2016.

313   There are four other key limitations of this project. One, the restrictions placed by the libraries to

314   photograph or return to articles inhibited further critical discourse analysis of visual symbolism

315   and semantic structures in the full article text. Two, the scope of this initial project limited our

316   ability to undertake comparative analysis with other thematic water topics such as agricultural

317   and natural disasters, or with other modalities of the Bangladeshi media such as internet blogs,

318   social media, television or radio. This limits our conclusions to printed media represented by the

319   Ittefaq, one of the only continuous published text. Three, the research team did not have access

320   to newspaper staff to explore their perspectives on editorial decisions and intentionality behind

321   observed results. Finally, we acknowledge that this content analysis represents one newspaper's

322   publishing decisions and should not be used to interpret readers internalization or behavioral

323   responses to the represented risks. These limitations do not jeopardize the findings and scope of

324   the analysis; instead they provide opportunities for future studies.

325

Table 1: Summary of inventory findings by thematic cluster using Main Key Words.

Risk Society Components	Discursive Filters	Periods of narrative		
		1980-1992 Constructing a risk-response paradigm	1993-2005 Deconstructing previous approaches: Uncertainty of concern and response	2006-2016 Reconstructing a controllable but more complex risk
Production and construction of risks	-Selection of topics and frequency of key words in articles: inclusion and exclusion. (Herman and Chomsky 1988, 132) -Problem Framing (Nisbet and Mooney 2007; Entman 1993) -Key events and structure of news reports (van Dijk 1988; Kristiansen 2017)	Coverage aligned to national development goals with greatest focus on tubewell infrastructure functionality and health risks related to cholera and diarrhea.	Coverage shifts to urgency and uncertainty to arsenic contamination but doesn't replace diarrhea; focus on TW functionality diminish with increased discussion of other physical infrastructure options.	Coverage increases in complexity and heterogeneity of article topics. Some alignment to national plans for piped systems but no dominant topic.
Allocation of blame	-Positionality of an article and frequency (Herman and Chomsky 1988, 38) -Newsworthy and Salience (Lippmann 1922; Entman 1993) -Identification of responsibility.	Front page focus on cholera and diarrhea 1983-92; Responsibility tubewell maintenance and repair assigned to government agencies and engineers.	Letters and editorials spike requesting safe water but no frontpage coverage; Arsenic blame attributed to nature. Government assumes responsibility to reduce uncertainty of exposure.	Country section articles dominant with diminished frontpage coverage. International comparisons increase to diminish unique severity.
Risk positions and distribution of concerns	-Use of language (Herman and Chomsky 1988, 43) - Direct/indirect attribution (Kristiansen 2017; Boykoff and Boykoff 2007; Entman 2007).	No focus on distribution of goods such as improved access. Children identified in cholera related articles but limited.	Arsenic distribution portrayed as universal and not delineated spatially or socially while government policies specifically identify vulnerable groups.	Minimal media attention to achievement of development goals or findings of government arsenic data collection.
Filtering of Information and legitimization	-Legitimation and filtering information (Herman & Chomsky, 1988, p. 118 and 125) - Identifying authority and building trust; -Salience, biases, and citations of information sources (Boykoff & Boykoff, 2007; Entman, 2007)	Articles rely heavily on unattributed sources, followed by government experts to legitimate risk. Characteristics are easily imagined and tangible i.e. number of broken TW or mortality rates	Arsenic risk defined by scientific, often international experts; Reporting focuses on contamination of specific wells; increased citation of government sources, fewer unattributed.	Decrease in total number of citations. small increase in attributed citations to NGO officials and academic sources for arsenic stories.
Risk severity and priority	- Calculability vs uncertainty of risk - Relative severity and use of comparisons - Editorials and subjective tone	Titles specify topic through past events and situational identifiers including specific data. Limited interpretation or intensification. Mortality emphasized.	Titles shift towards indirect identifiers, fewer data points, and 'Crisis' terminology emphasized for arsenic. Emphasis shift to number of cases.	Increasing use of general or nonspecific language in titles regarding water quality such as "Water problem in urban area."
Maintaining control and extent of reflexivity	- Sustaining crises or reporting fatigue(Kristiansen 2017) - Allocation of responsibility (Herman and Chomsky 1988, 43) -Staging and remedy (Entman, 1993)	Articles emphasized collective response and successes such as health services. Concept of 'diarrhea' less severe than cholera. Articles identify responsibility for public services to repair TWs.	Arsenic risk uncontrollable, loss of technocratic control until "nature" blamed. Uncertainty sustains dialogue.	Increased data available but not widely debated in articles, sustaining uncertainty while diverting coverage away from arsenic.

327 ## 4. Results

328 This following section discusses the empirical results of thirty-six years of the Ittefaq reporting

329 which identified 3,211 articles focused on drinking-water topics. The temporal and content

330 findings are summarized in Table 1.

331 ### 4.1. Production of concerns and declining coverage

332 The temporal distribution of the annual and thematic content, shown in Figure 2, provides a

333 multi-year perspective around the construction of drinking water concerns in the Ittefaq. The

334 annual number of articles shows that drinking water topics have been continually reported as

335 newsworthy in Bangladesh, meaning a long-term problematization within the public agenda.

336 Within the year-to-year reporting two spikes of increased coverage occurred during the 1985 to

337 1988 cholera outbreak and the height of the arsenic crisis in 2000 to 2004. Although a limited

338 portion of the total news cycle, drinking water topics have been sustained for decades within the

339 public discourse, contrasting other studies which identify risk-reporting as contingent upon

340 specific events, such as nuclear accidents or natural disasters (Kristiansen 2017; Anderson 2006).
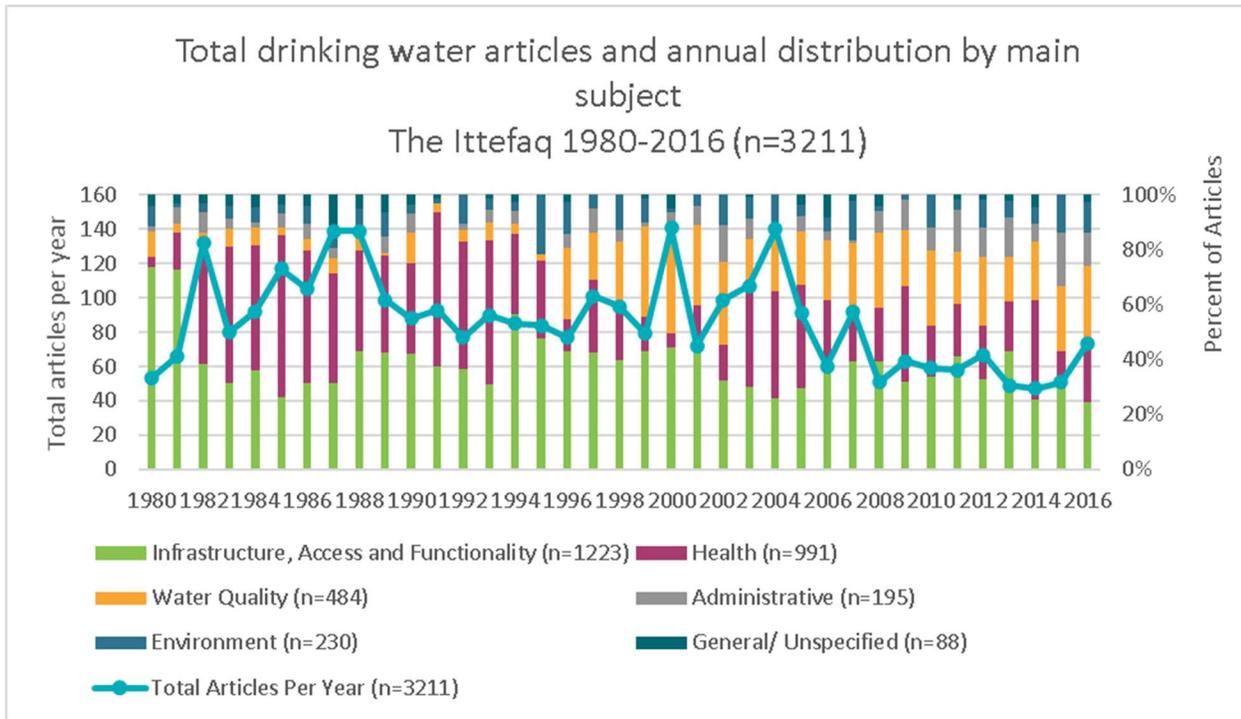
Figure 2 This summarizes the annal variation in the total number of drinknig water articles articles published per year and the proportional distribution by thematic cluster identified within the Ittefaq Newspaper from 1980 until 2016.

341   The inventory also reveals that the annual average number of articles declined after a decade of

342   the arsenic discussion. The average number decreased from 97 articles per year between 1980

343   and 2005 to 63 per year from 2006 to 2016, a nearly 40percent drop. This decline could be

344   explained through a lens of competing risk narratives, including the late 2000s food crisis.

345   However, the timing suggests reporting fatigue, occurring immediately after a period of

346   extensive policy, research and public debate around arsenic. This proportional decline contrasts

347   the increased policy prominence given to drinking water goals in the same period including

348   release of multiple government policies after 2005 and the global attention by reporting

349   achievement of the Millennium Development Goal(MDG) target on access to improved drinking

350   water sources.

4.2. Constraining concerns around infrastructure and cholera

351

352   Beyond annual trends, the discourse analysis filters assess how topics are problematized through

353   selection, frequency and prominence across article titles, subject and text. The Ittefaq inventory

354   revealed an identifiable pattern of inclusion and exclusion of specific themes, summarized in

355   Table 1. The most frequent main subjects over the 36 years, appearing in 52percent of the

356   articles, emphasized diarrhea-related concerns (cholera and diarrhea) and infrastructure

357   sustainability (functionality and reliability). These two topics specifically dominated reporting on

358   drinking water topics between 1980 and 1993, appearing as the main subject in over 70percent of

359   the articles, and 40percent of articles 1993-2016. These two topics reflect what scholars identify

360   as the government's dual priorities: 1)maintaining state legitimacy by providing reliable drinking

361   water infrastructure and 2)gaining international recognition through health system achievements,

362   reducing mortality rates by controlling diarrheal diseases (Hassan 2013; Hossain 2017).

363   Drinking water infrastructure gained significance during the independence movement when the

364   newly formed government committed to ensure the functionality of handpumps, a political

365   bargain to increase legitimacy with rural populations(Hossain 2018). The Department of Public

366   Health and Engineering(DPHE), supported by international agencies, implemented the programs

367   to increase the ratio of tubewells from 400 people per handpump in 1972 to a target of 135 in

368   1990 (Black 1990, 19). The Bangladeshi government pursued this state-driven water service

369   provision model for nearly two decades after independence (Black 1990), controlling the

370   production and distribution channels for handpump hardware and providing maintenance

371   services for all public water points through the 1980s. This established a further political interest

372   around provision of rural water services. Despite the increasingly prominence in national policy,

373   tubewells appeared as the main subject in 1.3percent of the articles but were referenced in over

374   45percent of the article texts. A quarter of the articles in the 1980s focused on place-specific

375   concerns of tubewell functionality, frequently using the same structure in the title: "X number of

376   tubewells are dysfunctional in Y location: scarcity of drinking water." This presented a

377   controllable concern where the government could respond to specific geographies.

378   After two decades of tubewell investment programs, the number of functionality articles declined

379   from an average of 21percent of total articles per year from 1980-1992 to 14percent between

380   1993-2005. The largest drop occurred in the years surrounding the political transition from the

381   Ershad government into competitive party politics in 1991, arguably reflecting end of the post-

382   independence state commitments ensuring tubewell functionality and shift in institutional

383   structure (GoB 1998). Leading into this shift, the international development agencies

384   increasingly placed pressure on the government to demonstrate aid effectiveness (Rizvi 1991).

385   The frequency of stories on dysfunctional handpumps contradicted technical national tubewell

386   surveys which reported over 90percent of public tubewells operational (UNICEF 1993). The

387   declined media reporting on functionality and shift to supply reliability reflects a reallocation of

388   concern to nature. This change in blame occurred in the context of reallocations of responsibility

389   away from the central government for service provision for tubewells and into one around multi-

390   user piped systems.

391   The media coverage in the late 1980s also began excluding explicit references to cholera and

392   replacing them with diarrhea terminology. Cholera was reported on extensively in the early and

393   mid-1980s, reflecting the ongoing policy and scientific attention from previous decades.

394   However, explicit references to cholera sharply declined after 1984, becoming entirely absent by

395   1990 with only a few exceptions in the 2000s. By 1989, the Ittefaq editorial page explained the

396   shift in vernacular by attributing it to the government: "The same old topic of diarrhea and

397 cholera needs to be discussed here again because the authorities are not willing to accept that

398 these deaths are caused by cholera. They use the term diarrhea. But whatever the name of the

399 disease, a death is a death whether it is caused by diarrhea or cholera"(*Ittefaq* 1989). This

400 editorial comment implies intentional government intervention over terminology influencing the

401 way reporting frames concerns for ongoing outbreaks, partially controlled in national

402 epidemiological surveillance systems which did not differentiate the causes (Siddique et al.

403 1992).

404 The change in terminology reflects a change in the concern around allocation of blame and

405 framing severity. Article titles discussing cholera frequently explicitly referenced the number of

406 reported deaths compared to diarrhea reporting after 1989 which largely focused attention on the

407 number of reported cases and spatial extent of the outbreak, not mortalities. For both tubewells

408 and waterborne diseases, the Ittefaq reporting reduced the salience for target audiences (Entman

409 2007). The timing of exclusions aligns with changes in national and international political

410 agendas, reinforcing Herman and Chomsky's argument that media places politically-motivated

411 discursive constraints on the problematization and representation of concerns.

412   4.3. Positioning arsenic uncertainty and mitigation

413 Within these macroscale thematic trends, the distribution of where articles are placed within the

414 newspaper sections further constrains the prominence, priority, and emphasis on severity of

415 specific content. Building on what Lippman(1922) identifies as the editorial decisions of

416 selecting which stories are most newsworthy, Herman and Chomsky(1988) use the positionality

417 of articles to explore the constructed importance of specific topics. As seen in Figure 3, the

418 frontpage articles, representing 14percent of the total inventoried articles, were highest in the

419 1980s, a period when the state had direct and indirect controls over the media industry and the
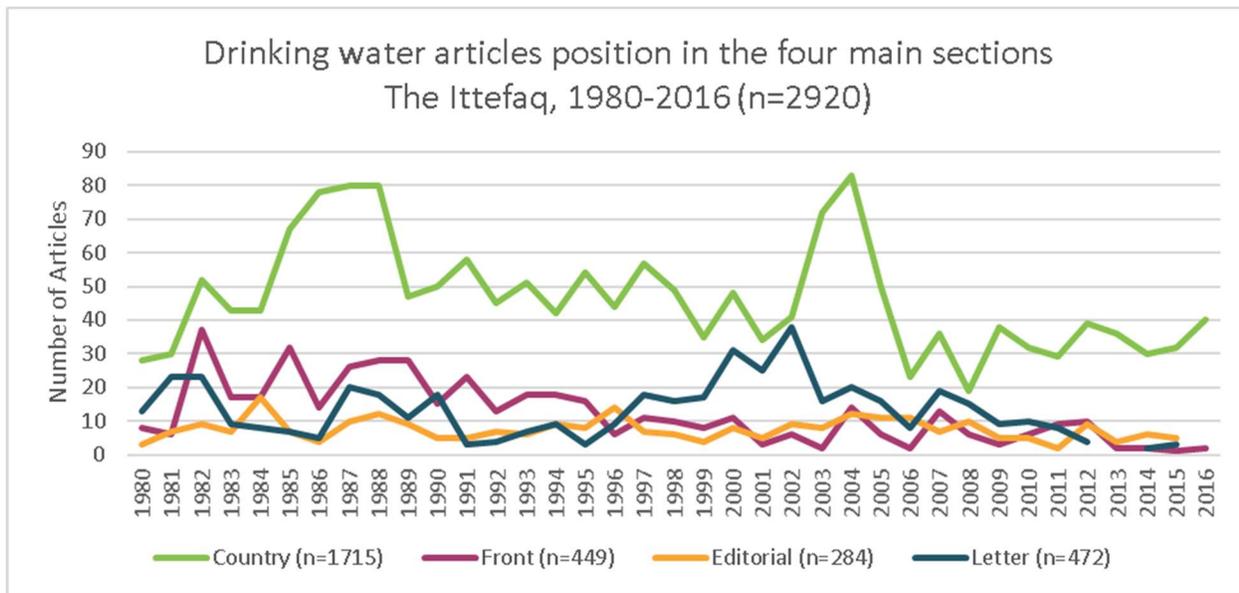
Figure 3 This compares the annual variation in the positionality of drinking water articles across the four main sections of the Ittefaq Newspaper, 1980-2016.

420   government-led solutions to cholera remained central to national development agendas.

421   However, the number of frontpage articles began to decline after the political transition in 1992.

422   This declining front-page prominence contradicts the technocratic portrayals of the severity of

423   the arsenic contamination. The first public recognition of arsenic in aquifers appeared in the

424   Ittefaq article in 1993, a decade after concerns were initially identified in public health circles in

425   West Bengal (*Ittefaq* 1993; Smith, Lignas, and Rahman 2000). The coverage of arsenic stories

426   occurred after 1995 in the "country" or national news section, not on the front pages. Although

427   articles described arsenic as a "national panic"(*Ittefaq* 1996) and coverage represented an

428   increasingly significant percentage of articles between 1996 and 2006 but a relatively limited

429   number of frontpage articles(20MKW, or 7percent of total arsenic articles). During the 1980s

430   and 1990s, frontpage coverage of diarrhea and cholera(185MKW, or 21percent of total

431   cholera/diarrhea articles) and functionality and reliability(79MKW, or 10percent of total stories)

432   was much higher as a portion of drinking water related articles and in number of stories. This

433   suggests a specific discursive approach avoiding emphasis on arsenic, a problem with initially

434 uncertain causes, poorly measured, chronic largely unseen impacts, and no immediate actionable

435 responses.

436 Multiple scholars have argued arsenic threatened the narrative of development successes of

437 previous tubewell access narratives (Caldwell et al. 2003; Sultana 2012). It was not until after the

438 national arsenic testing campaigns in 1999 and 2002-2005 that the techno-political development

439 community aligned around specific mitigation approaches, codified in the 2004 Arsenic

440 Mitigation Plan(GoB 2004). However, instead of increasing to interpret and interrogate these

441 findings and national awareness campaigns (Pfaff et al. 2017), the media coverage declined.

442 Media discussion of infrastructure alternatives, such as deep tubewells and piped water,

443 increased slightly after 2005, but not at the rate reflecting the urgency advocated by technical

444 evaluations.

445 The absence on the front pages of the Ittefaq were replaced by articles in the letters section.

446 Starting in 1996 when arsenic articles began being reported more frequently, the number of

447 letters per year surpassed that of the other sections, except "country," as seen in Figure 3.

448 Qualitative analysis of these articles suggest that they provide a vehicle for citizens to direct

449 concerns to the government entities that manage water services. A quarter of letters explicitly

450 directed requests to the Government's Water Supply and Sewage Authority (WASA) (106

451 articles). The main subject of over half the letters addressed issues of infrastructure, including

452 requests for access, repairs, and supply reliability. In contrast to the frontpage and country

453 sections, diarrhea and cholera represented the main subject of 2percent while arsenic appeared in

454 8percent and unspecified water quality concerns in 12percent. This shifted the direction of

455 discourse expanded the previous linear flows of the media being a risk definer to enable risk

456 consumers to influence the construction and focus of concerns.

4.4. Distribution of social and spatial risk positions

457

458 One of Beck's central arguments is that catastrophic hazards have transformed society into an

459 egalitarian distribution of risk, beyond previous models of hierarchical class-based distribution of

460 goods (Beck 2013). Several scholars challenge this view, including Curran(2013), who argues

461 that wealth differentials related to class continue to shape risk distribution and life-chances. The

462 Ittefaq article inventory largely reinforced Beck's view of undifferentiated social risk, rarely

463 allocating concerns to specific vulnerable populations or reports unequal impacts.

464 This reporting pattern diverges from the dominant agendas of global development goals.

465 Government policy documents and international agencies explicitly prioritize vulnerable sub-

466 groups, defined as the "ultra-poor," women, and children (GoB 2015; Sultana 2012). Within the

467 Ittefaq articles, "poor" communities were explicitly identified in 3.5percent of the 1,506 coded

468 articles, of which more than half discussed tubewell functionality and reliability before 2005.

469 Specific references to gender appeared in 2percent of the 1,506 articles, with over three-quarters

470 of those articles discussing diarrhea and related health treatments. References to children were

471 found in 7.5percent of the 1,506 articles, with nearly a third published between 1985 and 1988

472 related to the diarrhea and cholera outbreak. The disconnect between policy emphasis in

473 government publications not reflected in media articles suggests the politics of risk allocation at

474 national levels, not that of exposure or international agendas.

475
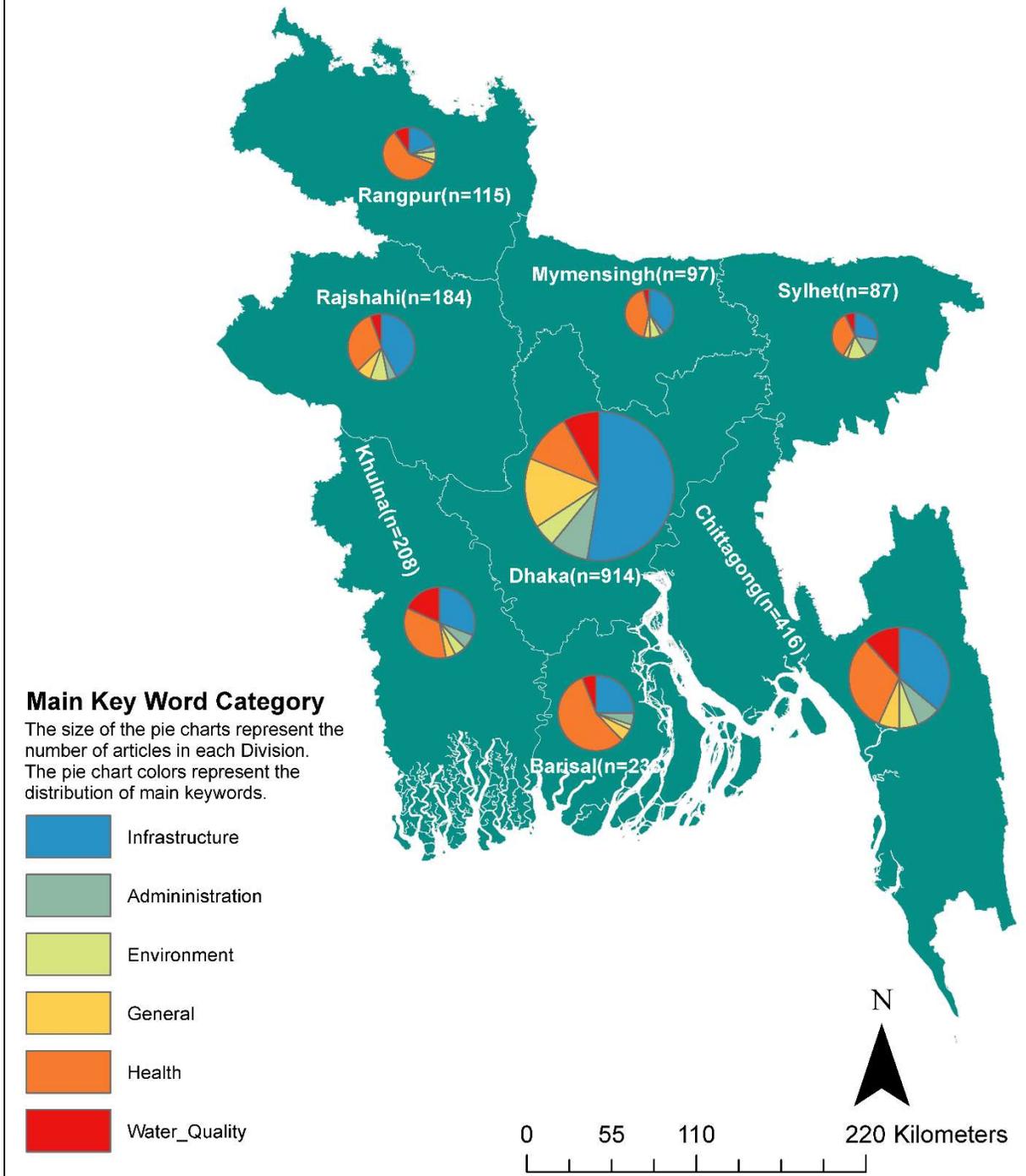
Figure 4 This map presents the number of drinking water articles explicitly referencing specific districts and the thematic distribution within the Ittefaq Newspaper from 1980 until 2016. Size of pie chart represents number of articles.

477   In contrast to social categorization, the spatial distribution of stories, seen in Figure 4, reveals

478   more articles were discursively located within urban Dhaka than other region. Among the articles

479   which specifically identified an administrative division(n=2,257), Dhaka appears in 40percent

480   while the divisions of Sylhet and Mymensingh appear in fewer than 5percent. This geographic

481   focus suggests that events were selected through the lens of what is newsworthy to the

482   readership, primarily urban circulation (Mahmud 2013), despite over 65percent of the population

483   classified as rural in 2016. This spatial pattern is further explained by information biases

484   resulting from more consistent measurement of urban piped water schemes and significant gaps

485   in rural monitoring. The place-specific media coverage was often maligned with technical

486   assessments of exposure, such as low number of articles covering high arsenic risk areas in the

487   Sylhet division or arsenicosis cases disproportionately represented in Dhaka compared to

488   contamination (WHO/UNICEF 2017, 42). The spatial distribution of risk positions appears to be

489   based on media reporting biases, not techno-scientific quantifications of concerns.

490   ## 4.5. Legitimizing the narrative

491   Beck argues that national risk imaginaries require the sensory organs of science to render their

492   existence visible and reduce the boundaries of uncertainty(Beck 2006a). Media studies offer

493   approaches to critically evaluate how the press engage expertise to define, legitimize, or cast

494   doubt on specific concerns (Nisbet and Mooney 2007). The Ittefaq articles reinforce Beck's view

495   of a contingent relationship, with nearly two thirds of articles(n=934 out of1,506) explicitly

496   citing data, statistics, study results, or experts within the story text. Almost half(49percent) of

497   those main keywords focused on infrastructure access, functionality or reliability, two thirds of

498   which appeared before 1997, prior to the arsenic crisis.
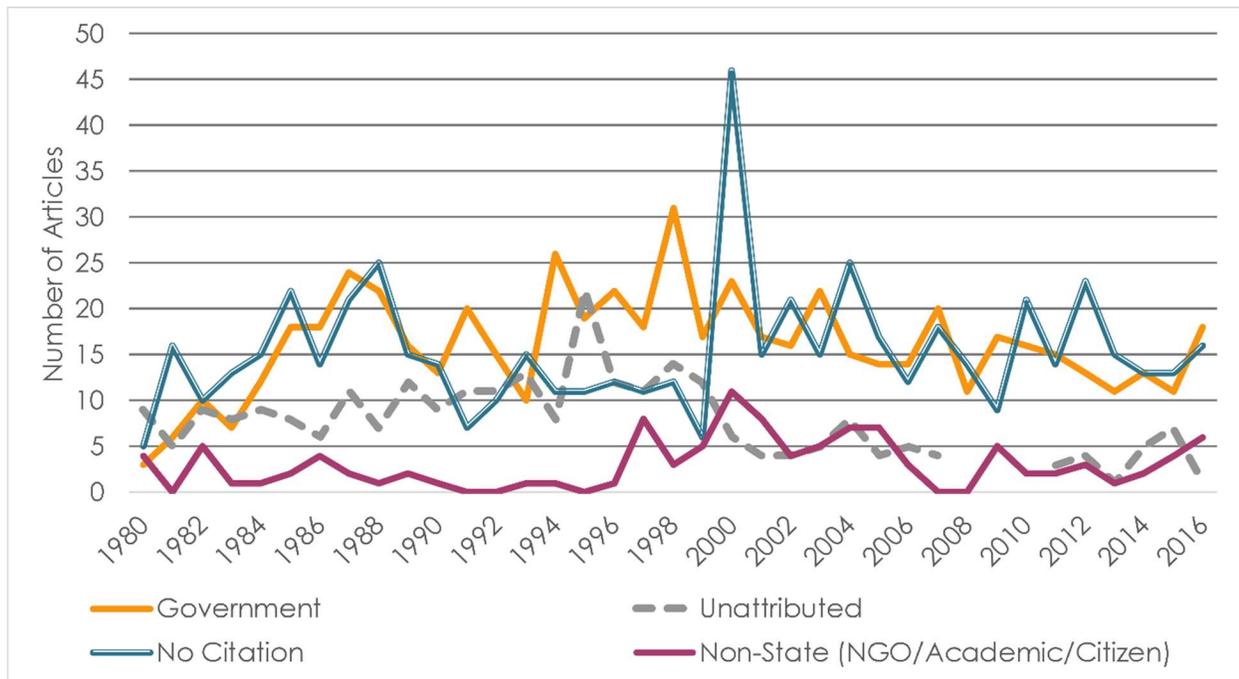
Figure 5 This compares the annual variation in the source of information cited within the drinking water articles from the Ittefaq Newspaper, 1980-2016.

499   Reliance on external information for validation varied between topics: arsenic articles were

500   heavily dependent, with 90percent including citations; climate, flood and drought articles had

501   63percent with citations. These topics contrasted with a lower proportion of cholera and diarrhea

502   articles, 18percent, having citations. While the initial coding method for this article was not

503   nuanced enough to differentiate tone or context of these citations, the results suggest that specific

504   topics were more reliant on expertise to interpret the uncertainty.

505   The power to define problems is further reflected by who the article cites to legitimize a concern.

506   As seen in Figure 5, over 60percent of the article citations identify the source as Government

507   sources, suggesting the state controlled the flow of information. A further 28percent of article

508   citations were unattributed, such as "a source" or "an expert," although declining sharply in the

509   mid-1990s after the opening of press freedoms and replaced by unattributed article. The

510   remaining citations(12percent) were attributed directly to NGO and academic sources. Although

511   articles provided limited direct connection to NGOs, the large percentage of unattributed

512   citations reflects a possible approach to maintain national ownership of the narrative and

513   authority with the government. Initial qualitative evidence suggests that many studies and data

514   are produced with the involvement of international agencies but published and accredited to

515   Government agencies, thereby reinforcing authority of the government and concealing the

516   influence of non-state actors in the media. Further study is required but these findings suggest

517   that the media reinforces the dominant power structures by filtering of sources of information.

518   4.6. Allocating of blame and responsibility: water quality versus health within an agenda-

519   setting discourse

520   Controlling the risk narratives becomes increasingly political as the causation, or blame for, the

521   concerns shifted from nature to society. Beck(1992) describes this transition as the reflexive

522   consequences of human decisions and technology. The Ittefaq inventory suggests this self-

523   confrontation did not occur: articles discussing water quality safety were reported on less than

524   half as frequently as health-related stories, as seen in Figure 6. Despite the extensive coverage of

525   diarrhea and cholera, issues of microbial contamination, including sewage contamination and

526   bacteria such as E-coli and *Vibrio cholerae,* appeared in significantly fewer articles: 5percent of

527   the articles referenced microbial topics in the body of the story text; fewer than 1percent of the

528   articles focused on microbial concerns as the story's main subject. Further, ambiguous or multi-

529   parameter water quality articles were more frequent than microbiological stories, specifically

530   increasing after 2005. While this is likely a result of measurement bias with health outcomes

531   more regularly tracked than water quality data, the titles of the water quality articles are

532   structured around ongoing problem identification with blame and responsibility attributed, often

533   explicitly, at public agencies: "Unhygienic WASA water: conflicts between authorities for
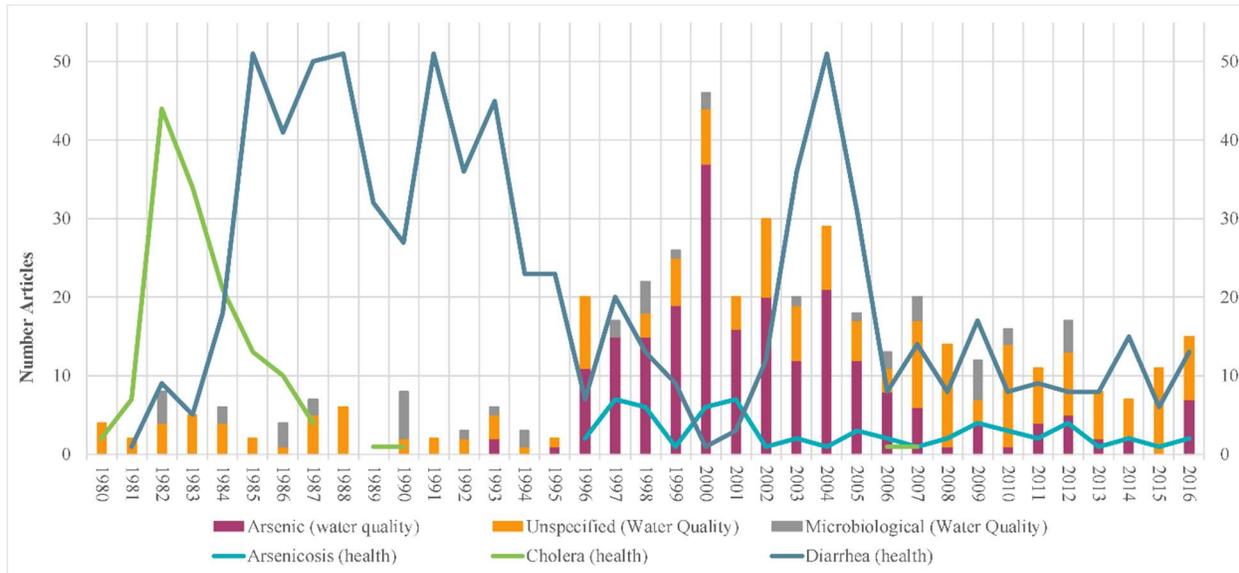
Figure 6 This compares the annaul variation of coverage of water quality and health specific articles by main key word in the Ittefaq from 1980- 2016

534   water"(*Ittefaq* 1984). This information structure contrasts the reporting approaches on diarrhea

535   and cholera which focus on past events, discussed above. The difference appears to be largely in

536   the temporality and allocation of responsibility, with water quality reporting, not including

537   arsenic, directly implicating the need for collective or public action.

538   This imbalance of reporting on water quality was reversed by the discovery of arsenic

539   contamination, deconstructing the previous risk narratives focused on the ability to manage and

540   control the problem. The uncertainty of source and spatial distribution were reported twice as

541   frequently as articles discussing the health outcomes of arsenicosis: the inverse pattern of

542   diarrhea/cholera to microbial contaminants. This suggests different politics of blame and

543   attention, with titles not directly allocating responsibility. Cholera and diarrhea are reported

544   around the acute symptoms, high certainty of cause and immediate tangibility of danger with

545   clear infrastructure and health treatments options. Arsenic in contrast was debated in a process of

546   reconciling the uncertainty of cause of contamination, and impact of chronic exposure with often

547   invisible symptoms and limited treatment options. One was represented in reporting as past risks

548   which are controllable while the other focused on unknowns in the future. The varying coverage

549   of water quality factors in newspaper articles constructs different narratives around the causality

550   and controllability of risks, and thus responsibility to act: one perpetuating the previous

551   development narrative of ability to manage human-caused risks while the other shifted blame to

552   nature while solutions were not immediately actionable.

553

554　5.　Discussion

555　This section interprets the multi-decadal media content analysis in relation to the politics of the

556　national development agendas. As summarized in Table 2, the empirical results reveal three

557　broad temporal clusters of drinking water narratives identified through risk-discourse filters and

558　content patterns.

559　*Table 2: Interpretation of newspaper inventory using risk-discourse filters by period of the narrative.*

Drinking water discursive themes and keywords	Key findings	Content Trends in Three Temporal Clusters		
		1980 to 1992 **Controlling concerns**	*1993 to 2005* **Mitigating uncertainty**	*2006 to 2016* **Interpreting complexity**
Health: Cholera, Diarrhea, Legionnaires', Typhoid, Jaundice, arsenic poisoning	Diarrhea, not cholera, continuously reported main topic. Limited comparative coverage of arsenic poisoning.	Cholera dominant topic until 1987. Replaced by diarrhea stories. A spike in reporting in mid-1980s. Period with largest number of health stories Average: 40 MKW per year	Diarrhea decreased in 1990s. Overshadowed by arsenic poisoning from 1999 to 2001. Health decreases in proportion to other topics Average: 24 MKW per year	Arsenic poisoning decreases and diarrhea re-emerges as most frequent health topic. Change in seasonality of reported diarrhea. Average: 13 MKW per year
Water Quality: E-Coli, Arsenic, Salinity, Iron, Heavy Metals, Water Quality General	Arsenic dominant topic. Other parameters relatively low coverage. Post-2005 titles use general water quality descriptors	Limited number of articles reference WQ in main subject or title. Microbial not discussed in late 1980s and early 1990s after cholera/diarrhea outbreak. Average: 5MKW per year	Arsenic contamination first reported in 1993. Uncertainty drives reporting and is significantly larger than any other parameter. Average: 20MKW per year	Large number of non-specified or general titles. Increase in salinity articles. Limited reference to toxicity and other environmental pollution. Average: 14MKW per year
Infrastructure: Tubewells (Deep and Shallow), Piped, Pond, Surface, Rain Harvesting, Pond Sand Filters	Majority of article texts discuss infrastructure but rarely as main subject. Tubewell dominant until 2008 when pipes overtake.	Tubewell most frequent key word. Surface water surpasses piped water discussions until 1999, except after cholera outbreak in 1987-1990. Average: 2.4MKW per year	Spike in tubewell and piped water systems focus in 2000 respond to arsenic. Alternative rainwater harvesting, and pond sand filters first appear. Average: 2.7MKW per year	Piped systems briefly surpass tubewells in frequency from 2008-2012. Increase in surface water and rain topics after 2013. Average: 1.7MKW per year
Access: Access to Improved Infrastructure, Affordability	Half articles located in letter section requesting service connections.	Spike in late 1980s after cholera and diarrhea outbreak. Many specific requests for constructing new tubewells. Average: 8 MKW per year	Spike in 1994 and again in 1998-2000. Frequently included in requests for arsenic free shallow and deep tubewells. Average: 9 MKW per year	Focus on gaps in coverage and safe water systems more generally. Less direct links to infrastructure types. Average: 6 MKW per year
Functionality: Infrastructure Functionality, Supply Reliability, Efficiency	Most frequent and consistent topic but declining after 1991; mostly reported in country section	Most frequent topic in 1980 to 1984. Focus on government role to repair malfunctioning tubewells. Average: 28 MKW per year	Decline in coverage after government transition. Average: 23 MKW per year	Focus shifts from functionality to reliability of supply. Average: 13MKW per year.
Administration/ Management: Politics, Budget, Public Communication	Steady but small increase articles across years with max of 16 articles per year. Large gaps in years covered.	Intermittent coverage. Centralized distribution of services with articles focusing on corruption referenced, but not mismanagement. Budget discussed until 1989. Average: 4 MKW per year	Limited coverage until arsenic crisis. Directed comments towards WASA management after 1999. Highest during arsenic crisis. Average: 6 MKW per year	Increased in coverage and consistency of articles after 2008. Political parties and disputes increasingly covered. Average: 6 MKW per year
Environment: Flood, Drought, Climate Change	Least frequent topic and limited connection to impacts	Flooding damage driving projects to provide new infrastructure. Average: 6 MKW per year	Drought articles more closely linked with uncertainty of water supply. Average: 8 MKW per year	Increased number of articles on drought outside of dry season. Average: 5 MKW per year

5.1. Constructing risk narratives 1971-1992

The first period of drinking water narratives in Bangladesh extends from post-independence in 1971 until the public identification of arsenic in 1993, however the Ittefaq inventory starts in 1980 due to archival limitations. This period is characterized by several interlinked concerns underpinning the elite consensus on national development strategies: reducing infant and maternal mortality rates, preventing cholera outbreaks, and increasing tubewell infrastructure access (Hassan 2013). The Ittefaq reporting constructed a narrative around these topics by problematizing cholera and diarrhea cases and public service delivery of infrastructure functionality. These concerns reflect international development targets which structured development aid based on national measurement of indicators which were publicly monitored. The construction of these risk narratives by the media, predominantly citing government authorities as sources of information, reinforced the central state's legitimacy and aligned to the agreed responsibility structures by framing the issues as controllable problems.

The political and institutional reforms of the late 1980s are reflected in the specific content and discourse shifts of the Ittefaq. While macro indicators, such as infant and maternal mortality, continued to improve, major cholera outbreaks and non-functioning tubewell infrastructure undermined the narrative of cost-effective development interventions. Simultaneously, pressure was mounting on the Ershad government from international agencies to demonstrate program effectiveness and justify continued flows of foreign aid, funding critical to the state authority through a patronage system (Rizvi 1991).The national press, remaining under the government's direct and indirect controls during this period, reinforced the states interests by shifting content production, specifically explicitly identifying cholera in articles and gradually shifting from functionality of tubewells to supply reliability problems. This represents a change in salience of

583   waterborne concerns by replacing reporting on the number of cholera-related deaths with stories

584   describing diarrhea as number of cases being treated.

585   The media behavior in this period suggests that while risk priorities reflected broader

586   international targets of improved access and reduced mortality, the narrative was constructed to

587   advance national state interests. The control over information distribution and definitions of what

588   is measured further limited public contestation of risk severity. These risk-discourse filters reveal

589   the constrained ability and interest of the media to extend the problematization, counter state

590   priorities, or interpret techno-scientific assessments.

591   5.2. Deconstructing the narrative: 1993-2005

592   The second period is characterized by the disruption of a controllable narrative by the public

593   acknowledgement of arsenic in 1993. The announcement aligns with the introduction of

594   competitive party politics, national elections, decentralization of service responsibility, and

595   increasing press freedoms reliant on new non-state revenue sources. The period is defined by the

596   socio-technical negotiation to deconstruct previous narratives of tubewell infrastructure and

597   groundwater safety, interpret the uncertainty of spatial risk distributions, and render arsenic into

598   a manageable concern. These uncertainties challenged previous political arrangements and

599   corresponding narratives focused on distribution of infrastructure and health services.

600   While global drinking water goals increasingly emphasized on-premise infrastructure systems,

601   decades of tubewell growth created a paradox for media and policymakers as the scope and scale

602   of arsenic increased concerns of potential exposure. This threatened previous development

603   agendas, including attainment of the Millennium Development Goal target based on definitions

604   of improved infrastructure access. The discourse filters reflected this tension: the media rarely

605 emphasized arsenic concerns on the front page despite many articles in the national news section,

606 diminishing the salience and contrasting previous cholera reporting. This resulted with a

607 contrasting construction of arsenic severity: a crisis in description but not in priority allocated

608 through discourse filters.

609 Further, reporters continued to predominantly cite government sources despite major

610 international aid agencies and academic investments trying to grapple with the cause, uncertainty

611 of spatial distribution, and mitigation options to the arsenic contamination. The discourse filters

612 suggest that in the early 2000s more articles had no information or experts cited than articles

613 with government officials, suggesting a temporary aversion to allocate responsibility in the face

614 of uncertainty. Without an immediate solution and high uncertainty, this suggests a discursive

615 approach to interpret the new risk without undermining the national ownership of previous

616 development successes.

617 ## 5.3. Reconstructing a controllable narrative 2006-2016

618 The most recent period from 2006-2016 is characterized by the divergence of media and policy

619 emphasis on drinking water and re-alignment of content problematization around new

620 multidimensional development targets. With greater freedoms of press and new advertising

621 incentives, the direct link of media and state interests eroded from previous decades. This period

622 shows a sharp decline in total number of drinking water related articles. While decline might

623 reflect these shifting media incentives or other priority concerns however it clearly contrasts the

624 public sector attention allocated to drinking water in a range of new policies and renewed

625 international commitments. This could also suggest a widening gap between national politics and

626 international development narratives with Ittefaq focused on domestic audiences. If true, this

627 implies drinking water remained on both agendas but was diminished in domestic agendas.

628   Despite the decline in media attention, both bodies of text problematized a more heterogenous

629   set of concerns, particularly water safety and quality, supply system reliability, and sustainable

630   management of multiple infrastructure types. This content shift mirrors the evolution of

631   Sustainable Development Goals definitions of drinking water security entering national

632   narratives. The decline of arsenic coverage after 2005 contrasted academic and civil society

633   concerns of increasing exposure suggests limited media interpretation of risk severity. This

634   period suggests the narrative was reconstructed to interpret complexity of water safety

635   reinforcing a model where blame is allocated to nature when outside of immediately controllable

636   problem-solution paradigms.

637   5.4. Implications of risk discourse filters and a constrained national narrative

638   There is a large body of academic literature on arsenic and cholera research spanning decades in

639   Bangladesh quantifying exposure, vulnerability, and responses, however there is limited inquiry

640   around how the media's discursive filters interpret and position these concerns. The empirical

641   results suggest that key concerns are represented differently between the Ittefaq and technical

642   literature, a known occurrence in climate-related discourse analysis but one which has not been

643   interpreted in the context of drinking water security(Boykoff and Boykoff 2007). The contrast is

644   most evident in the problematization of cholera and arsenic: despite ongoing identification of

645   exposure by technocratic studies the media, under government influence, excluded cholera from

646   public discourse and delayed public recognition of arsenic for a decade after initial discovery.

647   This avoided directly challenging the development narratives of achieving near universal access

648   to improved drinking water infrastructure. This further implies that the Ittefaq did not perform

649   the function of a conduit of development communication aimed at behavior change such as well-

650 switching promoted by NGO's. The result limited public self-confrontation around the side-

651 effects of infrastructure decisions and provision-based models.

652 The findings advance what Bakir(2010, 13) identified as gaps in longitudinal, historical,

653 contextual and interpretive methodologies to trace risk narratives at macro levels. The analysis of

654 Ittefaq newspaper uncovers how various levels of the development institutions and governance

655 transitions exert direct and indirect influences over the construction of drinking water security

656 narratives to shape the political meanings. These findings reinforce Herman and Chomsky's

657 view that media is influenced by dominant interests, which in this context is the dual pressures of

658 national and international development agendas. While the state's role appears to be dominant in

659 shaping the media's narrative, the indirect influence of NGOs and international organizations

660 requires further consideration in future work and coding. The significant number of unattributed

661 expert quotes suggests discursive positioning of other actors disguising their role and influence

662 while reinforcing the Government's authority and responsibility.

663 The results further identify the importance of discursive allocation of blame and risk

664 responsibility in shaping the political interests to control the overall narrative. Future work has

665 been identified to expand the theoretical and pragmatic implications for risk-response dynamics

666 across multiple texts, and the political meanings for state authority and management instruments.

667 The initial assessment suggests a limited political willingness for what Beck(2006a) describes as

668 reflexive governance, or the avoidance to prioritize and reframe concerns if they implicate

669 failures or unintended consequences of previous policy decisions. In the case of Bangladesh, this

670 questions the successful government tubewell campaigns and recent growth private markets.

671 This reinforces Beck's view of the contingent relationship between risk representations and

672 politics of national identities: reflexive risk threatens narratives of state control over development

673 power relations. The identified risk-discourse filters contextualize why certain risks are

674 problematized while others are reframed or prioritized differently, including the reframing of

675 previous concerns into opportunities. These findings reinforce that risks narratives are political in

676 construction and meaning.

6. Conclusion

678 The previous institutional approaches to managing drinking water security in Bangladesh were

679 challenged by the uncertainty of arsenic distributions and redefinition of cause-effect

680 relationships between nature and society. An empirical and longitudinal analysis of one of the

681 oldest continually published newspapers in Bangladesh provides unique insights into the

682 declining frequency and prominence of attention placed on drinking water security. The results

683 show some unexpected divergences between technical, political, and media narratives. First,

684 newspaper coverage of drinking water declined at the same time as completion of national

685 programs for arsenic mitigation and the recognition of the country's early achievement of MDG

686 drinking water targets; second, the media explicitly excluded "cholera" in article texts to shift

687 salience of the concern from mortality to treatability; third, the articles used risk reporting to

688 reinforce state legitimacy by citing government sources and information, diminishing the

689 prominence and role of NGO and civil society voices; and finally, the descriptive depiction of

690 arsenic as a crisis was not reflected on the newspaper's front pages, constraining the portrayal of

691 severity and exposure. These discursive behaviors reflect the dominant construction of problems

692 as controllable through technical and health solutions. Beck's theories help explain why arsenic

693 challenged this previous narrative through the high uncertainty of distribution, contested

694 allocation of blame, and lack of immediate mitigation options which wouldn't undermine

695 previous achievements of tubewell infrastructure provision.

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696   This analysis provides further insights into the institutional transitions across the three identified

697   temporal periods in Bangladesh, revealing a contested narrative between technocratic estimates

698   of exposure and the socio-political discursive process to render risks visible. The application of

699   risk-discourse filters advances several broader findings: the production and framing of drinking

700   water security is linked to political and economic development agendas; the discursive practices

701   used by the media reinforce the state's authority and control over the definition process; and the

702   media's distribution of social and spatial concerns diverges from technical estimates of exposure

703   and stated public policy priorities. These specific media approaches are significant for how

704   blame and responsibility are allocated within wider governance transitions. The results extend

705   Beck's framing of risk politics by identifying the limitations of the current institutional designs

706   to engage in the discursive process of self-confrontation around reflexive risks, a perspective

707   increasingly important for achieving drinking water security.

708

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