







## From creeping crisis to policy change: The adoption of drought preparedness policy in Brazil

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### ABSTRACT

This paper aims to understand the national-level policy change that occurred in Brazilian drought management, whereby the policy shifted from reactive crisis management to a drought preparedness approach. We found that a combination of factors supported the policy change, such as the interplay of multiple drought events in different regions of the country, the length and timing of these events, attention paid to the issue, and the role of policy entrepreneurs and political entrepreneurs in connecting solutions to the problem. The analysis is based on the multiple streams framework (MSF), which includes two windows of opportunity: an agenda window, to account for the juncture at which the drought issue appeared on the political and public agenda; and the decision window, when a drought preparedness instrument was designed and adopted. We contribute to the literature on policy change in the wake of a disaster by showing how a long-duration event sparked policy change and by shedding light on the role of creeping crises as focusing events; and we contribute to the MSF literature by analytically distinguishing the features of the agenda and the decision window and by applying the theory to a Latin American context.

**Key words:** Brazil, Creeping crisis, Drought, Multiple streams framework, Policy change

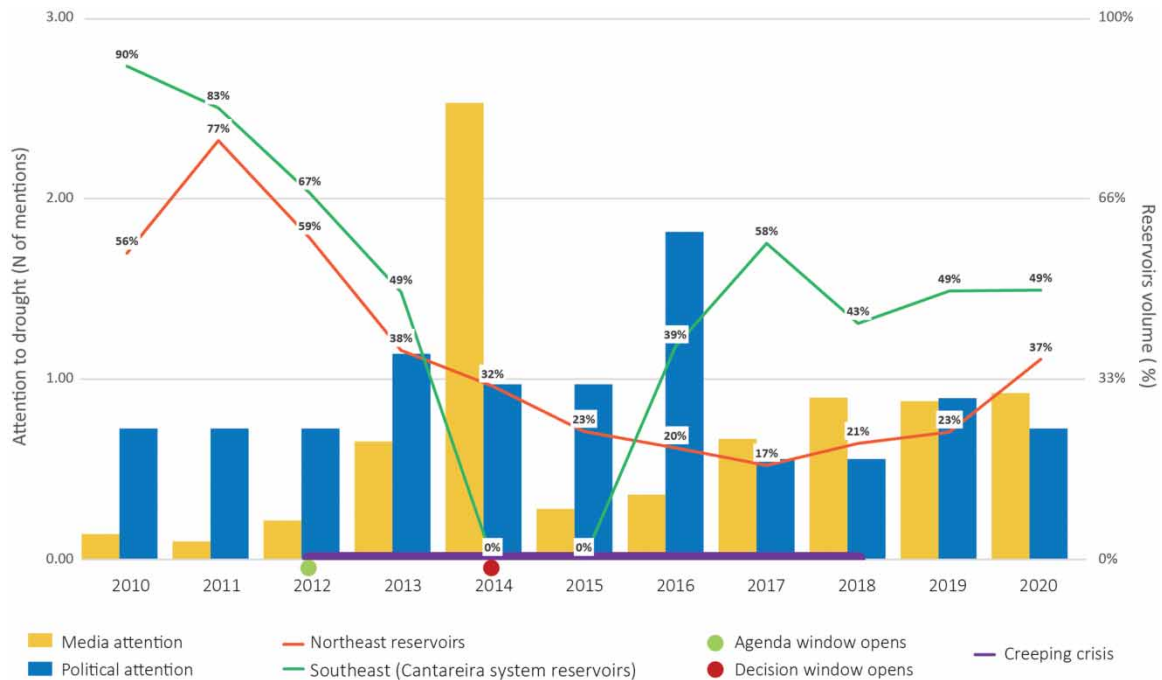
### HIGHLIGHTS

- Creeping crises are an opportunity to seek transformative responses by pursuing strategies that increase resilience to drought impacts.
- A creeping drought crisis triggered policy change from reactive crisis management to proactive drought preparedness in Brazil.
- The interplay of multiple drought events in the northeast and southeast regions of Brazil raised attention to drought.

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## GRAPHICAL ABSTRACT



## INTRODUCTION

In northeastern Brazil, droughts have long been recurring events, with historical records from the 16th century already speaking of the occurrence of droughts in this part of the country (Campos, 2015). Over the last 60 years, most Brazilian regions have faced severe and intense droughts (Cunha *et al.*, 2019): a northeastern drought that lasted from 2012 to 2018 (Filho *et al.*, 2020), a drought in the Amazon region in 2015–2016 (Jiménez-Muñoz *et al.*, 2016; Ribeiro Neto *et al.*, 2022), a west central drought in 2016–2017, and the southeast region, the wealthiest region in the country accounting for 55.4% of gross domestic product (GDP), experienced a severe drought between 2014 and 2015, with impacts on water supply, water quality, hydropower generation, and agriculture (Nobre *et al.*, 2016; Deusdará-Leal *et al.*, 2020).

Similar to other parts of the world, Brazil has traditionally managed drought reactively and tends to focus on crisis management. This reactive approach consists of a combination of temporary actions taken after society has experienced drought impacts; it is not focused on reducing long-term vulnerability to climate risks. Typically, a reactive drought response comprises relief assistance, such as water trucks and cash transfers, targeted at specific areas and groups affected (Wilhite, 2005).

Drought preparedness consists of proactive approaches focused on reducing risks, with the goal of improving institutional and operational capacities to respond to a drought event by taking actions prior to drought. Drought preparedness emerged as an alternative to reactive drought responses and typically encompasses monitoring and forecasting, vulnerability and resilience assessments, and mitigation and response planning (Wilhite *et al.*, 2001; Kamragou *et al.*, 2011).

This paper uses the case of the creeping drought crisis in northeast Brazil that lasted six years (2012–2018) and of the last southeast drought (2014–2015) to understand the national-level policy change in Brazilian drought

management, whereby the policy shifted from reactive crisis management to adopting a drought preparedness approach. To investigate this, we use the multiple streams framework (MSF). MSF is an appropriate lens for analyzing the Brazilian drought for two reasons. First, it seeks to explain how policymaking occurs in situations of high uncertainty and ambiguity. In this case, uncertainty refers to the duration, endpoint, and severity of droughts in Brazil; and ambiguity refers to a lack of common understanding about drought (March, 1991; Zahariadis, 2014). Second, a fundamental component of the framework is understanding how unexpected events, such as disasters, can lead to policy change (Birkland, 2004). For theoretical refinements, we follow Herweg *et al.* (2015) to include the two crucial windows of opportunity that are relevant when MSF is applied to understand policy processes beyond the agenda-setting stage: an agenda window and a decision window. The agenda window is the opportunity for the issue (i.e., drought) to appear high on the political agenda, whereas the decision window is the opportunity for the adoption of a particular policy (i.e., drought preparedness strategies). Furthermore, we use the concepts proposed in Sanjurjo (2020) to adapt the political stream to the Latin American context – for instance, to account for the presidential coalition.

The key research gaps that this paper addresses are (1) how a long-duration event, or creeping crisis, becomes a focusing event and (2) how extreme weather events lead to transformative policy responses: from reactive to proactive drought management. Previous studies observed the potential of sudden disasters acting as focusing events and opening windows of opportunity (Birkland, 2006; Michaels *et al.*, 2006; Becker & Reusser, 2016; Giordano *et al.*, 2021), but this paper explicitly analyzes the dynamics of more creeping crises and their influence on policy change.

The following research question guides this paper: How did the Brazilian creeping drought crisis of 2012–2018 become a focusing event that opened a policy window for a policy change from reactive crisis management to proactive drought preparedness? This main question is divided into two sub-questions: How did the creeping drought crisis in Brazil become a focusing event that opened the agenda window for drought preparedness? How did the decision window open that led to the adoption of drought preparedness policies in Brazil?

To this end, the article is structured as follows. The next section presents the relevant theory used in this study, such as creeping crisis, focusing events, and MSF and its elements. The third section briefly explains the political context in Brazil, aiming to explain the role of presidential coalitions. The fourth section presents the methodological aspects. The results are then presented in the fifth section and discussed in the sixth section. The article ends with a short conclusion.

## THEORETICAL FRAMEWORK

### Drought, creeping crises, and focusing events

Drought is often referred to as a creeping hazard or a slow-onset phenomenon because its impacts accumulate slowly over several months or longer, and it is difficult to determine the beginning or end of a drought (Wilhite & Glantz, 1985). More than 20 years ago, a creeping crisis was recognized as a process that is dormant over a prolonged period with unclear beginnings and ends (Hart & Boin, 2001). Recently, a new definition has been presented, characterizing it as a threat that evolves over time and space, subject to varying degrees of political and social attention, and insufficiently addressed by the authorities (Boin *et al.*, 2021). In contrast, a focusing event is ‘an event that is sudden, relatively uncommon; can be reasonably defined as harmful or revealing the possibility of potentially greater future harms’ (Birkland, 1998, 54). In MSF, a focusing event is considered an indicator of attention on problems. This concept has, however, been recently refined to account for longer-duration events and gradual accumulation (e.g., pandemics and droughts) as

focusing events (DeLeo *et al.*, 2021). In this paper, we further explore this second definition in relation to our case.

Drought can be seen, and is portrayed in the literature, as a creeping crisis, since its impacts propagate as a result of complex impact pathways. Drought impacts can be divided into direct and indirect impacts. This division clarifies how drought propagates over time and space but with no distinct boundaries of impacts like other natural hazards, such as floods or storms. The direct impacts of drought occur through the interaction between water-specific shortages and environmental, social, or economic factors. Such impacts affect agricultural production, public water supply, energy production, water transport, tourism, human health, biodiversity, and natural ecosystems. The indirect impacts cascade quickly through the economic system, affecting regions far from where the drought originated, and can linger long after the drought has ended. Such impacts include disrupted international trade, temporary or permanent unemployment, business interruption, loss of income, disease resulting from poor water and air quality, food insecurity, malnutrition, starvation, and widespread famine (UNDRR, 2021).

### Multiple streams framework

Kingdon (1984) proposed MSF as a theoretical approach to explain the agenda-setting process under conditions of complexity and ambiguity. The government agenda is the list of topics to which people in and around the government pay attention at any given time (Kingdon, 2014). Hence, agenda-setting is a process that involves intense competition, in which problems gain or lose governmental or societal attention, depending on the interest in the issue (Jones & Baumgartner, 2004). To visualize this process, Kingdon proposed a framework with three independent and parallel streams – problem, policy, and politics – with different actors.

The problem stream consists of socially recognized and constructed problems that become recognized thanks to indicators, focusing events, and feedback regarding previous policy programs (Kingdon, 2014). For example, water managers may frame drought impacts as either more human centered or more ecology centered (Cravens *et al.*, 2021), or drought may be framed as a socioeconomic problem when water resources systems fail to meet water demands or environmental needs (van Loon, 2015; Walker *et al.*, 2022).

The policy stream consists of ideas and solutions, with actors presenting alternative solutions to the problem (Kingdon, 2014). With regard to drought in Brazil, the solution stream was for a long time dominated by infrastructure solutions to deal with drought impacts, often guided by prevailing policy paradigms (Molle *et al.*, 2010; Medeiros & Sivapalan, 2020; Cavalcante *et al.*, 2022).

The politics stream consists of the political environment itself, including political parties, electoral processes, the media, interests of civil society groups, companies, or public opinion. The three core influencing factors for changes in the political stream are national mood, interest-group representatives, and political turnover (Kingdon, 2014). In the Latin American context, the politics stream is influenced by the presidential coalition and interest groups, followed by public opinion (Sanjurjo, 2020). A new political administration in 2003 had as its main objective the reduction of hunger in the country, which involved several ministries and coordination of inter-sectorial policies. Investments made in small water reservoirs (cisterns), for example, to achieve this aim had positive impacts on adaptation to drought impacts (Lindoso *et al.*, 2018; Cavalcante *et al.*, 2020)

These independent streams come together at critical times, most likely when a policy window opens. Kingdon (2014, 165) defined the opening of a policy window as an ‘opportunity for advocates of proposals to push their pet solutions or to push attention to their particular problems’. This window can open because of either a change in the political stream (e.g., administration change, a shift in the partisan or ideological distribution of congressional seats, or a national mood shift) or a change in the problem stream (e.g., when a new problem captures the attention of governmental officials or consequent to a sudden focusing event). Once the window is open, policy

entrepreneurs exploit the opportunity by using their skills and resources to promote specific policy choices, connecting problems to solutions and solutions to critical actors, resulting in a higher likelihood of policy change.

Policy entrepreneurs are actors who use their resources (e.g., time, energy, reputation, money) to induce policy change. They play different roles depending on the stage of the policy process (Meijerink & Huitema, 2010). For instance, they develop their ideas, expertise, and proposals beforehand and wait for the opening of a policy window. In the policy stream, they soften the process by advocating for their policy proposals, and they can also act as brokers, negotiating among people and making critical couplings. Overall, they do more than push their preferred proposals onto the agenda or raise awareness about problems: they use their agency in different strategies to promote desired outcomes (Kingdon, 2014).

Some topics receive attention on the government agenda; among those, a smaller set reaches the decision agenda (Kingdon, 2014). More recently, Herweg *et al.* (2015) introduced some refinements to the framework to include an analytical separation of the agenda-setting and the decision-making stage. The first, the agenda window, is identical to the window of opportunity in Kingdon's model. The second, the decision window, captures the moment of policy choice and focuses on the bargaining about the concrete design of the policy and its legitimization. A difference between the two windows is how they open: whereas the agenda window opens in the problem or the political stream, the decision window opens in the policy stream. Another difference compared to the original MSF is the role of the political entrepreneur in coupling the three streams: in the decision window, this is a person holding a political leadership role and is key for coupling the streams for a decision to be made.

This analytical separation with two different windows enables the analysis of the agenda-setting and decision-making phases before policy change and is particularly useful for studying parliamentary democracies where governments often govern through coalitions (Farstad *et al.*, 2022), as is the case in Brazil, where multiparty presidentialism requires successful negotiation for the president to form and maintain majority party coalitions.

## POLITICAL CONTEXT IN BRAZIL

Brazil's national government is based on a democratic federative republic with a multiparty presidential system. The Brazilian model assumes strong interdependence between the executive and legislative branches, although with a greater concentration of authority in the former. Also defined as coalitional presidentialism (Abranches *et al.*, 1988), the president's governing capacity depends on parliamentary support to transform his/her major public policy choices into laws. On the other hand, legislators depend on the executive branch's budget decisions to meet their electorate's demands (Abranches, 2018).

One of the main mechanisms deployed to strengthen the president's relations with the legislative branch, attract parties, and build political and parliamentary support is nominations to ministries and public agencies. There is no strict minimum number of ministries; the president has the power to establish and dissolve ministries and other high-level cabinets. Ministers and parties behind these ministries play an active role in shaping the executive's agenda and influencing the executive's decisions. Controlling a ministry is, therefore, an instrument for privileged access to decisions important to the party, for formulating policy proposals, and for allocating budgets (Garcia Lopez, 2015; Guimarães, 2020).

The president is the head of state, and the government is elected for a 4-year term, with the possibility of re-election for a second term. The Federative Republic of Brazil comprises the Union, the States (of which there are 26), one Federal District, and the Municipalities; these collectively make up the spheres of government. The National Congress exercises legislative power at the federal level. The federative is composed of two houses, the House of Representatives (which represents the population) and the Federal Senate (which represents the States and the Federal District).

Brazil's party spectrum is highly fragmented, with ideological inconsistencies. *Bolognesi et al. (2023)* recently attempted to characterize the parties according to a political spectrum of right and left. During the period analyzed in this research (2010–2020), Brazil had four presidents in the executive office, two of whom were from the left-wing Partido dos Trabalhadores (PT) – Luiz Inácio Lula da Silva (2010–2011) and Dilma Rousseff (2012–2016), who was impeached in April 2016. Vice President Michel Temer from the right-wing Movimento Democrático Brasileiro (MDB) formally assumed the presidency in August 2016 (2016–2018), followed by the extreme-right populist Jair Bolsonaro representing the right-wing Partido Social Liberal (PSL) (2019–2020) (*Neto, 2020*).

## RESEARCH DESIGN

We selected the case of drought responses in Brazil. We use the creeping drought crisis in northeast Brazil that lasted six years (2012–2018) and the last southeast drought (2014–2015) to understand the national-level policy change in Brazilian drought management, whereby a policy changed from a reactive risk management approach to the adoption of instruments aligned with the drought preparedness approach. This case study is motivated by an unusual example of a focusing event, a natural disaster lasting for about six years.

The case study focuses on two main drought events between 2012 and 2018. One occurred in the northeast region; this event is relevant from 2012 to 2018, because it is considered one of the region's worst droughts ever recorded, with impacts on water storage, agriculture, livestock, and industry (*Walker et al., 2022*). The other occurred in the southeast region, from 2014 to 2015. This drought is relevant because of its severity and impacts on the water supply of the Metropolitan Regions of Rio de Janeiro, São Paulo, and Belo Horizonte; hydropower generation; agriculture; and water quality (*Cunha et al., 2019*).

Although the crisis lasted from 2012 to 2018, we chose 2010 and 2020 as the starting and end points, respectively, for data collection and analysis for the whole study. This is because we wanted to analyze the reservoir water and the media and political attention on drought including two years that both preceded the start and followed the end of the creeping crisis (*Filho et al., 2020*).

Our case study employed various datasets, including interviews, media analysis, and analysis of primary (political and policy) documents to reconstruct the processes in the problem, policy, and political streams and the processes behind the opening of the agenda and the decision window.

### Data collection

The primary data consist of interviews. The secondary data include policy documents, such as reports, enacted laws, and agreements, media data, and water levels in reservoir data. To increase the overall robustness of the study, we triangulated the available secondary data with semi-structured interviews conducted with actors directly participating in planning, decision-making, policymaking, and implementation of the drought preparedness agenda and instruments. We gathered perspectives from two World Bank staff members, one former Ministry of National Integration official, the head of Meteorology and Water Management Institute of the State of Ceará (Funceme), and one senior drought planning expert who worked at different international, national, and state levels over his career (Table S1 in the Supplementary material presents the interview details). Interviewees were selected through a combination of purposive and snowball sampling techniques. For the face-to-face interviews, the researcher asked the interviewees to draw a timeline with the main events that marked the change process.

To measure the level of political attention on drought and find the punctuation moments of attention on the theme over time, to understand when the agenda and the decision window opened, we took the Message to the National Congress as an indicator of presidential attention. This type of document is used and recommended

to analyze the Brazilian symbolic agenda (Brasil & Capella, 2019; Capella & Brasil, 2022). Capella and Brasil argued that it is a document that can translate the president's priorities for a given period and that the periodicity of publication allows comparisons over time. It is a constitutional requirement for the president to issue this document yearly at the opening of the legislative session of the National Congress. It contains a message and a government plan that explains the country's situation in many areas and suggests measures to resolve problems. In our analysis, we included one document under the Lula administration (2010), six documents under Rousseff (2011–2016), two under Temer (2017–2018), and two under Bolsonaro (2019–2020) (Table S2 in the Supplementary material presents the document overview).

To measure the level of media attention on drought and find the punctuation moments of attention on the theme over time, to understand when the agenda and the decision window opened, we collected newspaper articles from two national newspapers available on the Nexis Lexis platform: *O Globo* and *Folha de São Paulo*. We consider them a good indicator of national media attention on the problem. We searched for the word *seca* (drought in Portuguese) within the 2010–2020 timeframe, aiming to ascertain the punctuation of the media attention to identify the point at which the creeping crisis became a focusing event. The initial search produced 6,950 results, some of which were unrelated to drought in the sense of water scarcity given that the word *seca* is used in various contexts in Brazil. We applied filters to remove double meanings of that word, and the result was 2,458 relevant articles. The analysis focused on the number of newspaper articles and not on their content.

To measure drought severity, we used the water volume in the reservoirs as an indicator of hydrological drought. Unlike other types of droughts (e.g., meteorological, agricultural, socioeconomic), this type can be defined in simple terms such as the reduction of water levels in reservoirs (van Loon, 2015). Public administration and policy fields have an interest in observing these, as this is when society begins to perceive the impacts of the drought, and public managers are concerned about decreasing amounts of water stored in reservoirs to supply water and electricity to cities. We collected the data from the Reservoir Monitoring System of the National Water Agency and Sanitation (ANA). We retrieved data about all reservoirs in the northeast, and for the southeast, we used the data for the Cantareira System. The decision to use only this system for the southeast derives from its relevance for the region: it supplies 65% of São Paulo city's water demand for 8.8 million people and was the most emblematic example during the period analyzed.

## Data analysis

According to Bardin (2016), content analysis is developed in three steps: pre-analysis; material exploitation; and treatment, inference, and interpretation of results. In the pre-analysis step, we selected documents, took notes for discussion, and formulated our research question. In the material exploitation step, we added the transcriptions of interview records and secondary documents to the qualitative data analysis program Atlas.ti (version 22). The coding process to analyze the raw texts followed predefined codes based on MSF theory. The codes were political stream, policy stream, problem stream, political entrepreneur, policy entrepreneur, policy window, agenda window, and decision window. We coded the relevant text excerpts in line with the codes. For example, to be included in the politics stream category, quotes needed to speak about the political environment, office turnover, and elections. The coding process reflects a transformation, according to specific rules, of the raw text data. This transformation enables a representation of content in relation to the codes of interest (Bardin, 2016). The final step consisted of the interpretation of results, in which we treated and analyzed the data with a deductive inference. We brought together various data sources to reconstruct the processes with a timeline to organize the facts within the problem, policy, and political streams, and the agenda and the decision window.

We used the Nexis Lexis platform tools to create a quantitative graph to identify the frequency of drought as a theme over the years to ascertain the years that had punctuations in media and political attention. For instance, in years for which we found a punctuation, we examined newspaper content to understand the context in which the drought was being reported.

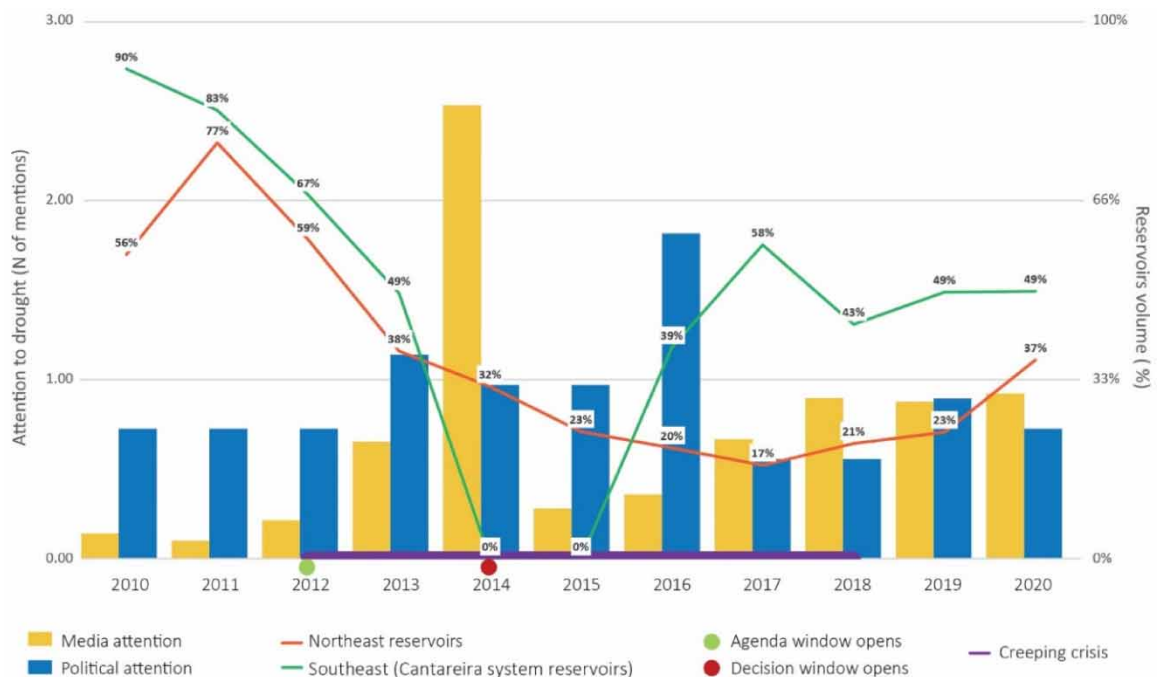
## RESULTS

This section answers the two research sub-questions. The first sub-section explains the processes behind the opening of the agenda window and therefore shows how the creeping drought crisis became a focusing event. The second sub-section explains the processes behind the decision window and shows how the policy change toward drought preparedness became adopted.

### Agenda window

The creeping drought crisis became a focusing event as a result of a combination of factors, comprised of the interplay of multiple drought events in different regions of the country, the length of these events that led to more severe impacts nationally, the timing whereby the southeast drought occurred immediately after attention focused on the northeast drought, and the particular role of policy and political entrepreneurs in exploiting the opportunity to promote the proactive drought preparedness approach.

Figure 1 visualizes the creeping crisis that enabled the drought to remain persistently in the spotlight in the media and the political community. The last multi-year drought in northeastern Brazil began in 2012 and extended to 2018 (Filho *et al.*, 2020). Drought was ongoing in the northeast, but the southeast also experienced drought impacts in 2014 and 2015 (Nobre *et al.*, 2016). A longitudinal analysis shows a combination of



**Fig. 1** | Media and political attention on drought (left axis) and percentage of water in reservoirs (right axis).



hydrological and qualitative data. The graph bars represent the fluctuation of attention on drought by the media and the policy community in yellow and blue, respectively. The lines represent the percentage of water volume stored in reservoirs in the northeast states and in São Paulo's Cantareira system. Drought attracted growing attention from 2013 to 2014 in the media, when the northeast and southeast regions experienced acute impacts, respectively. Political attention on drought was greater from 2013 to 2016.

The long-duration crisis opened two policy windows, an agenda window and a decision window. The agenda window opened as a result of changes in the problem or political streams. In this case, in 2012, changes in the political stream combined with a creeping crisis, and policy entrepreneurs allowed the coupling of the streams (Figure 1) and opened the agenda window.

The 2012 extreme drought in the northeast region triggered the policy community's attention on the issue. In the politics stream, the change emerged from the Minister of National Integration, who asked the World Bank for support to structure a national policy on drought in eight months, because in the following year (2013), he was going to leave office to work for the upcoming election campaign in 2014. He decided to work on drought because in 2012, the northeast was already in a severe drought scenario (Interview 5). The World Bank, however, argued that it was too short a time to develop an ambitious project, but that it was possible to start the discussion around a few points (Interview 3). In parallel, together with a policy entrepreneur, the World Bank invited the minister to the High Level Meeting on National Drought Policy (HLM) to share Brazilian propositions and experience in managing drought (Interview 3).

The left axis relates to the data on attention on the drought theme in the media and policy documents. Data were collected and analyzed by the number of times the issue was mentioned, and later they were standardized for better representation on the graph. The right axis represents data for the water reservoirs in the northeast and the southeast of Brazil. The unit is the percentage of water in the reservoirs. The data for the northeast region is average for 540 reservoirs, specific areas had extreme conditions.

The problem stream was dominated by the perception that drought events were attributable only to the northeast region. Drought was framed as an issue of water scarcity, which is at the root of all other impacts, such as lack of water for human and animal consumption, agriculture, and other economic and social activities (Document 2). As mentioned earlier, throughout history, several great droughts have been recorded in the region since the 16th century (Silva, 2003; Campos, 2015).

The HLM played a critical role in developing the policy stream. Before discussions on this event, the government responded with two reactive approaches when faced with drought impacts – first, emergency responses such as trucks for supplying water to scattered populations, job creation called 'work fronts' to ensure that the unemployed population had a minimum income, insurance for farmers who lost their crops, and subsidized corn prices to feed livestock. The second reaction, which had a more permanent character, was to build water infrastructure, such as large reservoirs to increase water supply and reduce future vulnerability (Document 2). The HLM pushed the proactive response to drought, and the primary outcome was the declaration unanimously adopted to apply the overarching principles of a national drought policy aimed at drought risk reduction at subnational level by implementing drought preparedness plans (Sivakumar *et al.*, 2014).

At first, government experts fulfilled the policy entrepreneur role. Two of them were from two northeastern states, Ceará and Pernambuco, and one was a senior national-level policy officer. They exploited the beginning of the creeping crisis as a focusing event, as an opportunity to raise awareness about new strategies to deal with drought impacts (Interviews 2 and 6). Two of the policy entrepreneurs were engaged in organizing the International Conference on Climate, Sustainability, and Development in Semi-arid Regions (ICID) in 2010, ICID + 18 in Brazil, and, in 2011, ICID + 19 in Argentina and Niger. The objective was to convene people and

institutions to discuss the challenges and potentialities of dryland regions and also to strengthen the issue on the upcoming agenda of Rio + 20 in 2012 (Document 1, Interview 6). When the northeast drought started in 2012, the opportunity was taken to push for new solutions based on discussions at these conferences (Interviews 3 and 6).

### Decision window

The focus of our second research sub-question was to use MSF to understand the opening of a decision window leading to the adoption of drought preparedness policies. If agenda coupling is successful, a decision window will open in the policy stream with a policy proposal ready for the decision. This stream counts as ready to couple if at least one technically feasible idea is available and discussed by the policy community (Herweg *et al.*, 2015). Here, we recognize 2014 as the opening of the decision window (Figure 1), the year in which the concrete design of the Drought Monitor was negotiated. Given Brazil's continental size and institutions with different levels of organization within the country's states, the program expanded gradually. To date (February 2023), 24 states out of 27 are part of the Drought Monitor, with only three northern states – Amapá, Pará, and Roraima – still to join the program to reach national coverage. We recognize the policy adoption juncture when ANA officially institutionalized the Drought Monitor in 2020 (Documents 3 and 4). Before this formal institutionalization, since 2017, the Monitor had been with other institutional and financial arrangements overtime with the World Bank, ANA, Funceme, National Institute of Meteorology, and the Ministry of National Integration.

The first step toward drought preparedness was to work on the Drought Monitor for the entire northeast and on drought contingency plans for specific regional locations. The bargaining period about the concrete design of the policy started in January 2014 with local workshops with relevant institutions at the federal and state level to discuss the operational and institutional design of the Drought Monitor. A collaboration between the federal government and the World Bank started in the northeast region on a pilot basis; the Drought Monitor for the northeast was launched at the beginning of 2016 and subsequently expanded to cover the whole country (Interviews 1, 3, and Document 2). The Brazilian Drought Monitor is a tool that aims to integrate the existing technical and scientific knowledge in state and federal meteorological and water institutions to reach a common understanding of drought conditions, such as severity, spatial and temporal evolution, and local impacts. The evolution of these drought conditions is reported monthly through maps delineating regions affected by different degrees of drought severity.

In the policy stream, while the Drought Monitor was being implemented in the northeastern states, other Federal Government measures were also in place, such as the Ministry of Mines and Energy's establishment of an Integrated Committee to Combat Drought in the semi-arid region to coordinate the government's actions to combat drought in the northeast and Minas Gerais State (Document 2). Furthermore, the World Bank played multiple roles in this stream. One was to bridge the international community experience with Brazilian experts, such as promoting an exchange of knowledge with the United States National Drought Mitigation Center at the University of Nebraska-Lincoln and with the Comisión Nacional del Agua's Monitor de Sequía de América del Norte in Mexico. And, by organizing a study expedition with stakeholders from Brazil to the Colorado River Basin to share the established drought monitoring experience in this region (Interviews 1 and 3). Nationally, the World Bank's positive reputation in projects already executed in Brazil, especially in the northeast, helped institutional mobilization among the states and financial support for the Monitor's implementation (Interview 2).

Unexpectedly, in the problem stream, a drought event became an acute crisis for the southeast and central-west regions. The southeast in particular experienced an unprecedented hydrological drought between 2014 and 2015, with impacts such as a deficient water supply for São Paulo Metropolitan Region, hydropower generation,

agriculture, and lower water quality (Deusdará-Leal *et al.*, 2020). The drought started to be seen as a problem that would also have impacts on other regions. It was no longer a problem typically of the northeastern region, as it affected other regions and raised attention because of broader economic impacts. In particular, this event attracted more sustained attention on drought because the economic impact was greater in the wealthy southeastern region (Interview 5).

In the politics stream, a change occurred in the Ministry of National Integration. The secretary for water infrastructure assumed the position of minister after the HLM in 2013 and remained in charge until the end of 2014. Despite the political alignment, one interviewee mentioned that the supportive political climate was ‘a necessary but not sufficient condition’. In his own words, ‘the political climate could be supportive, but if all these other things did not happen [prolonged drought and champions], we would have ended up where we were before’ (Interview 1). One of the hindrances in the process was the political conflict between the Governor of São Paulo state (PSDB), and the President Dilma Rousseff (PT), two important and opposition parties disputing federal and state elections. The crisis in São Paulo became a hot topic of debates with the electorate, and both candidates for re-election blamed each other for the ongoing crisis (Interview 4).

The main challenge in the decision window phase was to ensure the continuation of the policy by convincing ANA to formally institutionalize the Drought Monitor. ANA was identified as the right institution to formally institutionalize the Drought Monitor in January 2014, because it has a related mission as a technical institution to implement and coordinate the management of water resources (Interviews 2, 3, and 5). And, because it is not highly political as ministries (Interviews 3 and 5), it was therefore less influenced by political turnovers or political instability.

The new minister was also crucial to this convincing process to ensure the policy’s continuation. He was one of the entrepreneurs, identified here as the political entrepreneur, who constantly argued and discussed with different actors the need for ANA to incorporate the Monitor (Interview 2). One interviewee mentioned that ‘in the beginning, it was like ANA didn’t trust the idea and didn’t want to have a responsibility to keep the Monitor in there’ (Interview 5). One of the policy entrepreneurs, together with the World Bank, constantly met with one of the ANA directors to convince about the need of maintaining and funding the drought monitor, and the main arguments were to raise awareness about the money and time saved by proactive drought management, rather than building new water infrastructure and other crisis management actions (Interviews 1, 3, 4, and 6). After one of the ANA directors was convinced about the relevance of the project at a national level, he also became a policy entrepreneur, who also convinced the board of ANA directors to institutionalize this instrument (Interview 4).

In all interviews, the informants reported that the prolonged drought in the northeast and other drought events that affected several regions of the country influenced the implementation of the Drought Monitor and the discussions around the drought preparedness approach. One mentioned that the severe and persistent drought helped actors ‘materialize’ the discussion around the event that was in course (Interview 5), another mentioned the ‘flame’ that kept the process going (Interview 4), another used the term ‘serendipity’ in relation to the severe drought as a window of opportunity that triggered action by actors (Interview 1).

## DISCUSSION

This paper has looked at how a creeping drought crisis became a focusing event. We found that this was the result of a combination of factors, such as the interplay of multiple drought events in different regions of the country, the length and timing of these events, attention on the issue, and the role of policy and political entrepreneurs in connecting solutions to the problem. We pointed to the juncture during the 2012–2018 period when the agenda (2012) and the decision (2014) window opened, leading to the adoption of a drought preparedness instrument,

the Drought Monitor. We first discuss the main findings in relation to our contribution to the literature, then provide suggestions for future research.

With our research, we showed how a long-duration event helped spark policy change. The main policy change was an incremental shift from reactive crisis management to a proactive risk-based approach intended to increase the country's institutional coping capacity and thus create greater resilience to future drought episodes. The adoption and expansion of the Drought Monitor is evidence of a proactive drought preparedness instrument in practice (for more information on the Drought Monitor, see [Gutiérrez \*et al.\*, 2014](#)). In its most visible form, the Monitor is a monthly map that describes the current state of drought. However, more important than the map are the processes that encompass monthly meetings to discuss the current drought conditions locally. This routine improves institutional and operational capacities to respond to a drought event. It is a change from previous practices, when drought was discussed only after society felt the impacts or after major economic losses. Our findings resonate with [Nohrstedt \(2022\)](#), who suggested theoretical scenarios about the role of disaster impacts on major policy change. Our case illustrates the scenario of a lagged effect, in which policy change occurred gradually as disasters accumulated, requiring policy and political entrepreneurship to push the process. This finding has important implications for using long-term events as an opportunity to seek transformative responses to a threat by pursuing strategies that increase resilience to impacts.

Our second contribution to the literature is that we shed light on the role of a creeping crisis as a focusing event. A key characteristic of a creeping crisis is the fluctuation in attention on a subject, varying between social and political communities ([Boin \*et al.\*, 2021](#)), and a missing sense of urgency compared to the situation in an acute crisis. In our case, the fluctuation in attention on the issue over time was triggered by a combination of drought events in different regions of the country. The crisis started with a drought in the northeast, followed by a drought event in the southeast of the country. This led to fluctuating attention on the issue by the media and the political community for a longer period than if the crisis had been only in the northeast. The chances of the problem being neglected were high, because drought was seen as inherently characteristic of the northeast. The timing and duration of these events, which led to major economic impacts, raised awareness of the potential damage caused by the threat and created an opportunity for policy and political entrepreneurs to couple the streams on the agenda and the decision window.

Our third contribution is to the MSF literature by reflecting on the role of a creeping crisis as an opportunity to open an agenda and a decision window. Analytically distinguishing the features of these windows can be useful for conceptually understanding the role of a creeping crisis and how long-term policy processes behind policy change unfold in agenda-setting and decision-making processes. Within the streams, the process of opening the agenda window was as [Kingdon \(2014\)](#) theorized. An extreme drought event in the northeast acted as a focusing event attracting attention on the problem. The agenda window opened in the political stream with the political willingness of the minister who requested support from the World Bank to structure a national drought policy. From this moment, policy entrepreneurs used their resources to create the conditions to attach solutions and ideas discussed in the ICID conferences. The timing was also right regarding the international discussion on drought preparedness at the HLM promoted by the World Meteorological Organization. At this event, Brazil's government committed to developing and implementing national drought management policies. It started with the Drought Monitor, which was a technically feasible idea discussed by the policy community during the meeting. As argued by [Herweg \*et al.\* \(2015\)](#), whereas the agenda window opens consequent to changes in the problem or political streams, the decision window opens in the policy stream. In our case, the worked-out proposal for agenda coupling was the Drought Monitor, a policy proposal ready for discussion by actors in the political stream. These actors discussed the details of the policy, such as institutional arrangements and pilot regions for implementation. The decision window opened in the policy stream, but a change of political leadership in

the political stream, with a new minister acting as political entrepreneur, was key to bargaining about the concrete design of the policy and its final legitimization.

Some differences from how [Herweg et al. \(2015\)](#) proposed applying MSF to decision-making lie in the definition of the political entrepreneur role and the decision coupling opportunity. For instance, they argued that the political entrepreneur role is fulfilled by an actor who holds an elected leadership position. In our case, the role of political entrepreneur was fulfilled by the Minister of National Integration, who was a high-level cabinet member nominated by the president rather than being democratically elected, and who had some freedom to formulate and negotiate policies. This role played by a minister reflects the importance of presidential coalitions and interest groups in the political stream, as a particularity in the Latin American context ([Sanjurjo, 2020](#)). Another difference lies in the decision coupling phase. Authors have argued that successful decision coupling ends with the adoption of a new legal act. In our case, the decision coupling was successful when the technical agency ANA incorporated the drought monitor in its national policies, implying a higher probability of continuity even with future political turnovers.

Further research should investigate policy entrepreneurs' role and strategies in navigating the different streams. The separation of actors and their roles between streams can become blurred at some junctures in the policy process. In our study, for example, policy entrepreneurs together with the World Bank acted as problem brokers ([Knaggård, 2015](#)) in the problem stream by framing the current drought as a severe event and the arguing on the limitations of reactive crisis management. They navigated in the policy stream by presenting the drought preparedness approach and by raising awareness of the money and time that could be saved by preparing for the hazard rather than reacting to it. The influences of policy entrepreneurs have proven different from what [Kingdon \(2014\)](#) first theorized for the United States of America context, where they were described as passive agents waiting for the right moment to act ([Cairney, 2018](#)), whereas nowadays their role as agents of change in policy processes is clearer. For instance, recent empirical research has shown how policy entrepreneurs can make a difference as mindful and proactive orchestrators of policy change processes in climate change governance in the Netherlands ([Brouwer & Huitema, 2018](#)). [Dolan \(2021\)](#) described the role of policy entrepreneurs in policy processes in Australia. She found that policy entrepreneurs used issue-linking strategies in the political stream to overcome policy inertia regarding issues on water management and climate change adaptation. In that case, the millennium drought did not function as a focusing event but was a catalyst for strategic actions by policy entrepreneurs. Our research did not fully capture the relevant strategies deployed by policy and political entrepreneurs in each stream, as we focused more on events within streams and the evolution of the creeping drought crisis. We therefore recommend this as a research gap for further investigation in Latin American contexts.

## CONCLUSION

Our research focused on the question of how the Brazilian creeping drought crisis of 2012–2018 became a focusing event that opened a window for a policy change from reactive crisis management to proactive drought preparedness. The research found that the Brazilian creeping drought crisis of 2012–2018 became a focusing event as a result of a combination of factors: the interplay of multiple drought events in different regions of the country, the length of these events that led to more severe impacts nationally, the timing whereby the southeast drought occurred right after attention had been raised on the northeast drought, and the particular role of policy and political entrepreneurs in exploiting the opportunity to promote the proactive drought preparedness approach. The agenda window opened in 2012, when changes in the political stream combined with a creeping crisis, and policy entrepreneurs allowed the coupling of the streams. The decision window opened in 2014, when policy solutions were discussed regarding the concrete design of the Drought Monitor. The main policy change

was an incremental shift from reactive crisis management to a proactive risk-based approach intended to increase the country's institutional coping capacity and thus create greater resilience to future drought episodes.

We used the MSF refined by [Herweg et al. \(2015\)](#) to include an analytical separation of the agenda-setting and decision-making stages, with an agenda window and a decision window. Analytically distinguishing these windows was useful for conceptually understanding and unraveling long agenda-setting and decision-making processes leading to policy change during the period of a long creeping drought crisis.

This article offers potential contributions to the literature about policy change in the wake of a disaster by: (1) showing how a long-duration event sparked policy change and (2) shedding light on the role of creeping crises as focusing events; and to the MSF literature by: (3) using the theoretical refinements to MSF to analytically distinguish the features of the agenda and decision windows and (4) applying MSF to a Latin American context, which a literature review suggested was the region where MSF was least applied, behind Oceania, Asia, and Africa ([Jones et al., 2016](#)).

In the case of a creeping crisis that is comprehensively studied and understood, but lacks urgency, we recommend that, to take advantage of long-term policy windows, policymakers have their proposals ready for discussion to frame the problem, raise attention, and couple transformative solutions to the issue when a hazard creates the first opportunity to do so. In the absence of an explicit opportunity, such as a natural hazard, we recommend the development of a business case of knowledge around the subject, together with key stakeholders and locally affected communities, to raise attention and create support for the issue. In all cases, we see policy perseverance as key to the ability to frame a long-term crisis as a problem, raise political attention on a threat, and lead to policy change.

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## DATA AVAILABILITY STATEMENT

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

## CONFLICT OF INTEREST

The authors declare there is no conflict.

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