Policy Agendas and Environmental Protection: How Agenda-Setting Matters

Agenda-setting is the initial stage in policymaking. This article investigates whether agenda-setting influences the outcome of the policy process. Based on data from the policy agendas of Chinese provincial governments, our empirical study discovered that more attention to environmental protection in core policy venues could help improve provincial air quality. However, because of limited space on the political agenda and competing issues, an increasing proportion of the issues with the highest priority on the policy agenda are associated with poorer environmental quality, illustrating how "top issues" tend to crowd out environmental concerns. Furthermore, we found no evidence that policymakers' agendas influence provincial air quality. The findings enrich our understanding of the critical role of agenda-setting in the policy process. More broadly, this study seeks to apply agenda-setting literature and methodology to a one-party state in order to better understand the agenda dynamics.

Introduction

Agenda-setting represents the initial stage in the policymaking process and is a long-standing theme in political science literature (Downs 1972; Kingdon 1984; Jones and Baumgartner 2005). Kingdon (1984) defined the policy agenda as "the list of subjects or problems to which government officials, and the people outside of government closely associated with those officials, are paying serious attention at any given time." Therefore, most agenda-setting literature, particularly comparative agenda studies, focuses on revealing the changing logic of policy agendas and the factors that drive governments' attention to specific issues (John 2006; Baumgartner 2016; Baumgartner and Jones 2010).

Despite the diversity of topics covered in the agenda-setting literature, these studies all agree that the policy agenda has limited space, primarily because of policymakers' bounded rationality (Jones and Baumgartner 2005; Simon 1985). Therefore, political organizations must set priorities in the various issues they handle in daily governance (Fraussen, Halpin and Nownes 2021). This is not only a re-election strategy, but also contributes to effective governance (John et al. 2013). Downs (1972) identified this phenomenon of "issue competition" in his research on the environmental agenda cycle, stating that environmental issues may fade from the agenda as other issues gain prominence. Therefore, the status of an issue on the agenda frequently changes because other issues are added or eliminated.

In this article, we ask the following questions, all of which are related to agenda-setting and issue competition but have received insufficient attention to date:

- From the perspective of policy process, does agenda-setting affect policy outcomes?
- Since issue competition is unavoidable, under what preconditions does the policy agenda correlate with positive or negative policy outcomes?
- Given the pivotal role of political elites in policymaking, can policymakers' agendas influence the outcome of governance on specific policy issues?

To address these research questions in a Chinese context, we focused on the policy agenda and environmental policymaking at the local level in China in order to empirically investigate the relationship between agenda-setting and regional air quality. Specifically, we attempted to understand the impact of agenda-setting on environmental policy outcomes from three points of view: (1) the salience of environmental issues in core policy venues of local governments; (2) the position of competing issues on the policy agenda that may crowd out other issues; (3) the specific form of agenda-setting.

Empirically, this study investigates the agenda of regular meetings of the Provincial Standing Committee (PSC) and the site visits and written directives of the provincial Party secretaries (PPS) of thirty-one provinces in China between 2016 and 2021. We chose to study local government because this allows us to evaluate environmental quality against a rich dataset of monthly changes in the policy agenda and to examine the link between these two variables in more detail. To do so, we first measured the agenda points of the PSC's meetings and the PPS's individual activities using a combined content analysis and machine-learning method, and then investigated the impact of agenda-setting on monthly provincial air quality through multiple linear regression.

The empirical findings show that increased attention to environmental protection by local government contributed to the improvement of air quality. However, since the space on the policy agenda is limited, environmental quality declines as the proportion of top priority "political issues" on the agenda increases. Additionally, there is insufficient evidence that policymakers' agendas influence the outcomes of environmental governance.

In the following, we begin by reviewing the literature on agenda-setting and issue competition. We then introduce the Chinese background and core hypotheses and outline our research design. Finally, we present and discuss the empirical results, and conclude with the contribution and implications of our findings.

Review of the literature on issue competition in agenda-setting

The tension between scarce attention and abundant information is unavoidable for governments that must multitask. As a result, the mismatch between ability and reality often leads to the disproportionate allocation of policymakers' attention to certain issues (Jones 2003). This pattern of attention allocation rooted in the cognitive structure of

policymakers is the main reason for issue competition. While the space for issues on the policy agenda may be limited in practice, it is not fixed. Consequently, the priority given to various issues on the policy agenda may shift at any time, even though the evolution of agenda dynamics produces a stable equilibrium in the long run (Green-Pedersen 2007). Some studies describe issue competition as a "zero-sum game," because more attention to some issues is always accompanied by a decrease in attention to others in a limited agenda space (Zhu 1992).

According to recent research (Peake, 2016), changes in issue priorities are closely related to issue attributes, the main one being how important an issue is considered to be. Important issues are always salient or prominent on the existing agenda. In other words, the more salient an issue is, the higher it rises on the priority list (Dearing and Rogers 1996). Moreover, there are a few "core issues" that are always important in government decision-making. These core issues correspond to the basic functions of modern government, so that increased attention to them often squeezes out non-core issues (Jennings et al. 2011). For instance, the increase in the space allocated on the agenda to the non-core issue of immigration only reflects an adjustment of policy attention in the field of human rights, but it does not alter the overall structure of a government's agenda space. However, shocks such as war or economic crises always lead governments to restructure their agenda, which means that some non-core issues are further de-prioritized or even removed from the agenda altogether (Jennings et al. 2011).

Policymakers may also influence agenda-setting and issue competition. In the policy process, it is difficult to have a significant impact on the agenda space if an issue is not perceived by policymakers as a "problem" worth discussing (Rochefort and Cobb 1994). Furthermore, existing studies have found that policymakers' differing ideologies and personal beliefs influence issue prioritization (Mortensen and Seeberg 2016). In

addition to issue attributes and policymakers, a few studies also highlight the impact of institutional factors on agenda dynamics. According to Yates, Whitford and Gillespie (2005), there may be multiple reasons for giving an issue more space on the organizational agenda, including promoting the issue's national visibility and legitimacy as an important public concern. Their study of the US Supreme Court's agenda argues that agenda-setting is a function of internal organizational needs and external political signals.

The study of issue competition has helped us to better understand the patterns of agenda-setting in modern government. However, existing research cannot reveal the relationship between agenda-setting and policy outcomes. While it may be assumed that governments' attention to specific issues leads to better policy outcomes, empirical research to support that claim is limited. Furthermore, this assumption ignores an important fact about agenda-setting: governments' allocation of agenda space to a single issue is conditional on their attention to all issues. Therefore, it is necessary to investigate the impact of issue competition in agenda-setting on policy consequence.

Research objects are another potential gap in the existing literature. Most studies on issue competition have focused on democracies, while research on non-democratic governments remains inadequate (Yildirim, Bulut and Ilter 2022). This could be due to a lack of agenda data on non-democratic countries in the Comparative Agenda Project (CAP) database.[1] Although the institutional environment and administrative operation of non-democratic countries differ from those of democracies, authoritarian governments likewise have limited agenda space. In particular, some authoritarian states, such as China, exhibit omnipotent government characteristics, making issue competition unavoidable (Shen and Cao 2020). Therefore, while the literature presented above has developed a detailed theoretical understanding of issue competition in democratic government, the

logic of issue competition in non-democratic governments requires much more elucidation.

The background to agenda-setting and environmental governance in China

Given this gap in the existing literature, we focused on contemporary China and selected the agenda-setting of provincial local governments for empirical analysis. In China's vertical administrative system, the province connects the macro-political system of government to the municipal and county level. As the top level in the hierarchy of local government, the province plays a leading role in Chinese local governance and has thus become a major focus of research seeking to achieve a better understanding of China's politics and policy process (Li 1998). It is worth noting that, unlike democratic countries, provincial Party committees, the Chinese Communist Party's (CCP) main local agents, wield "real power" in local governance (Lieberthal and Lampton 2018). This "real power" includes not only the absolute authority to appoint personnel at the next level of government, but also the power to make final decisions on important public matters (Wu and Zhang 2018). In everyday politics, the PSC is the core policy venue of each province (Lee 2021). It is usually composed of twelve or thirteen members, each of whom is in charge of a specific area, such as macroeconomics, government operations, public policy, and other party affairs (Figure 1). The PSC meets on a regular basis, usually three or four times a month, to discuss various issues concerning the province's economy and society and to develop formal policy plans, which provides an opportunity to observe the dynamics of local policy agendas in China. More importantly, owing to China's Party-state regime, there is no clear political-administrative dichotomy in its system (Guo-Brennan 2021). Therefore, focusing on the PSC agenda also helps to reveal the interaction between "political" and "administrative" issues in the agenda space.

[insert Figure 1 about here]

Our primary goal was to empirically investigate the impact of agenda-setting, particularly issue competition, on policy outcomes. It should be noted that policy outcomes in this study refers to the consequences of governance of specific public affairs, which potentially represents better public goods provision (John et al. 2013; Rotberg 2014). Therefore, in considering policy outcomes we need to focus on a specific area rather than talking about them in general. In this sense, environmental governance is an ideal subject for research, because environmental protection, as a pure public good, is a basic responsibility of modern governments, and governments in any country must include environmental issues on their agenda (Dovers 2013).

However, little is known about the impact of agenda-setting on environmental quality. Especially in China, environmental pollution caused by "compressed development" since the 1980s has seriously harmed China's sustainable development, prompting the government to pay more attention to environmental issues in recent years (Kostka and Zhang 2018). Within China's top-down bureaucracy, there is a so-called environmental decentralization system, which means the central government is mainly responsible for the formulation of macro-environmental policies, while local governments are the specific executors of these policies (Ran 2017). Although there is ongoing debate about the effectiveness of China's environmental decentralization – because local governments have an incentive to flexibly implement central directives – there is little doubt that local governments control the majority of the human and financial resources for environmental protection (Eaton and Kostka 2014). Therefore, it is natural to ask whether local government attention to environmental issues in agenda-setting affects environmental quality. Furthermore, since the government's attention is limited, environmental protection will invariably compete with other issues on the agenda. Therefore, environmental protection provides a good scenario for investigating the

relationship between agenda-setting and policy outcomes. In the next section, we will elaborate on our core hypotheses.

Hypotheses

The significance of agenda-setting for the policy process is that when an issue is included on the agenda, it often means this will be followed by new government initiatives (Jakobsen and Mortensen 2015) – the higher the issue placement, the greater the probability of political action. In other words, the position of certain issues on the agenda will further influence the allocation of policy resources for related issues (Ullrichova 2022). Environmental protection, as an important responsibility of local government in China, has become increasingly prominent on the local policy agenda (Kostka and Nahm 2017). The emphasis on environmental protection by local governments is inextricably linked to the institutional constraints that China has imposed to deal with severe environmental pollution. For example, China established a pollution reduction mandatory plan in its 11th Five-Year Plan. Since then, provinces have been required to meet pollutant reduction targets, and the promotion of local officials is linked to environmental performance (Xu 2011). In addition, the Environmental Protection Law of China was revised in 2015 and introduced a lifelong responsibility system and strict penalties for officials with poor environmental records (Kostka and Nahm 2017).

It is worth noting that, although more attention to environmental issues by local governments does not necessarily mean more sustainable and efficient policy implementation, under a result-oriented authoritarian incentive system, local governments tend to exchange short-term policy attention for rapid improvement of regional environmental quality, so as to avoid top-down accountability and bottom-up public protests (Eaton and Kostka 2014). Therefore, since the PSC's regular meetings have the final say over major public affairs in the province, and the issues discussed in

this core policy venue represent the highest political level, if the proportion of environmental issues on the PSC's agenda increases significantly, more government action focusing on environmental protection can be expected. This is further increasing the possibility of a rapid improvement in regional environmental quality in the short term. This leads us to formulate the following hypothesis:

- *Hypothesis 1: A rising proportion of environmental issues on the agenda of the PSC's monthly meetings will increase the likelihood of rapid improvements in provincial environmental quality.*

Hypothesis 1 only considers the impact of the position of environmental protection on the PSC's agenda, but the limited agenda space determines that environmental protection must compete with other issues. Thus, the PSC's attention to environmental issues cannot be fixed. The research conducted by Jennings et al. (2011) on agenda diversity found that just a few core issues, such as macroeconomy and government operation, accounted for a relatively stable proportion of government agendas. Moreover, core issues will crowd out other non-core issues, implying that the government will be more willing to use the space occupied by non-core issues on the agenda in order to focus on core issues, rather than focusing on other "niche issues" at the expense of core issues, particularly those with the highest priority. In summary, the relationship between core and non-core issues is unequal; attention to core issues determines not only which core issues will be included on the agenda, but also which issues will be excluded.

In contrast to democratic states, China's Party-state system means that the PSC not only has decision-making power over public affairs within the province, but is also the CCP's main agent at the local level. Thus, its daily policy agenda will invariably include a variety of "political issues." In this sense, the PSC's agenda is rife with

competition between traditional policy issues like environmental protection and social welfare as well as between political issues and policy issues such as Party affairs and environmental protection. It should be pointed out that issue competition in itself does not indicate whether important environmental issues will remain on the policy agenda, but it does affect the relative importance of environmental protection in the PCS's agenda space. Therefore, despite the growing importance of environmental problems in China, if a competing issue, especially a "top issue", is supposed to have a strong crowding-out effect on environmental issues. This means that the possibility of environmental issues being excluded from the agenda rises, which can be expected to have a negative impact on environmental quality. Overall, in light of issue competition, we propose hypothesis 2:

- *Hypothesis 2: A rising proportion of competing issues with a strong crowding-out effect on the agenda of the PSC's meetings will increase the likelihood of poorer provincial environmental quality.*

Although the regular meetings of the PSC are the core venue for agenda-setting, another form of agenda-setting in China's local governance cannot be overlooked: the agenda of policymakers. This reflects major government officials' issue preferences, which differ from the policy agendas agreed upon by all (Zhu 1992). Policymakers' agendas are also widespread in Western democracies. For example, US presidents often sign executive orders to express their policy priorities and compete with Congress for leadership on critical issues (Rutledge and Larsen Price 2014). In China, owing to the lack of a system of checks and balances, and independent media, the role of the policymakers' agenda receives more attention. Scholars measured political salience using Chairman Mao's written directives and discovered that agencies that received more directives were less likely to be terminated (Chen, Christensen and Ma 2019). In

addition to written directives, Chinese officials frequently conduct "site visits" at the grassroots level, which are seen as an important source of the policymakers' agenda. Studies also found that site visits by China's local officials improve government performance and policy diffusion (Ma 2017; Ren, Zhou and Hu 2018).

The existing literature argues that local officials in China play an important role in environmental governance (Eaton and Kostka 2014). However, can individual policymakers' attention to environmental protection really lead to better environmental governance outcomes? We contend that this proposition requires more empirical assessment. On the one hand, under China's cadre evaluation system, the symbolism of local officials' individual activities often considerably outweighs their significance in practice (Gao 2015), hence officials' attention to environmental issues may be a 'window-dressing' for superiors' benefit rather than an indication of actual action.

Under such circumstances, policymakers' attention is unlikely to significantly improve regional environmental quality. On the other hand, unlike disaster response or other time-sensitive public affairs, environmental protection often necessitates the participation of multiple departments and has a time lag. In policy practice, local officials' agendas, such as written directives, usually address a very specific policy problem (Ma, Bao and VanLandingham 2022). Therefore, policymakers' agendas have a limited impact on overall environmental protection outputs when compared to more explicit and widely accepted administrative instructions negotiated through the PSC's meeting. Accordingly, we proposed the following hypothesis:

- *Hypothesis 3: The inclusion of environmental issues on policymakers' agendas will have little impact on provincial environmental quality.*

Research Design

Measuring the local policy agenda

Scholars use CAP data to measure the policy agenda of democratic governments (Dowding, Hindmoor and Martin 2016). However, data from the Chinese government has yet to be included in the CAP database. In view of this, we established a new dataset to track the PSC's agenda dynamics. Specifically, we collected data on the PSC's monthly meetings in thirty-one Chinese provinces between 2016 and 2021. Transcripts of these meetings were obtained through a manual search of provincial government websites, which was supplemented by archive requests to check for omissions. Finally, we obtained 24,551 texts that recorded the time, topics and main content of each meeting. In addition, following the practice in the existing literature of measuring policymakers' agendas in the Chinese context (Ma 2017; Ma, Bao and VanLandingham 2022), we collected information on site visits and written directives of the PPS in thirty-one provinces between 2016 and 2021 by searching the "leadership activities" column of provincial government websites, with a total of 8,269 texts.

Since the agenda-setting of local governments in China has not been well studied and the traditional agenda codebook does not consider the characteristics of policy issues under China's Party-state system, we need to take an inductive approach in order to reconstruct the policy agenda of Chinese local governments. To do this we use a combination of topic modelling, manual coding, and machine-learning (Bayerlein et al. 2022). The approach begins by establishing a clear policy issues category using the topic model and manual coding. Then, supervised machine-learning is introduced to automatically identify and count specific agenda points within each text.

Specifically, we first used the non-negative matrix factorization (NMF) topic model, which yields effective topic identification (Cross and Greene 2020), to initially

reveal the potential topic structure of texts. Second, we randomly selected 10% (N=3000) of the texts for manual coding based on the issue categories yielded by the topic model. The purpose of manual coding is to further clarify the relationship between topics, so as to reduce the bias of the data annotation in machine-learning. With reference to the CAP codebook, the manual coding process strictly followed the steps of the seven-stage qualitative text analysis (Kuckartz 2014). After that, we established the category of policy issues and their keywords (see Table A1 in the Appendix A). Third, we annotated 3,000 texts according to this category and used it as a training set, and randomly selected another 3,000 texts as a test set for machine-learning to achieve automatic encoding of all texts.

There are two main reasons why we eventually decided to use machine-learning instead of manual coding to process all the texts: First, manual coding has shortcomings in large-scale data processing, because it not only takes a long time but also does not guarantee coding consistency; second, machine-learning has been increasingly applied in the study of agenda-setting, especially when the topic structure has been defined in advance through topic modelling and content analysis, with the effect of machine-learning being superior to manual coding (Gilardi et al. 2022).

We briefly report the descriptive statistical results of the measurement of provincial policy agendas after completing the data processing. We obtained a total of 57,797 agenda points from different types of texts, including 43,236 agenda points for PSC meetings, 13,096 agenda points for site visits, and 1,465 agenda points for written directives. Figure 2 depicts the proportion of various issues on the PSC's agenda. We see that politics, the economy, and organizational management account for far more than other issues and are clearly the PSC's "core issues," while environmental protection accounts for only 4.19, ranking 10th out of a total of 23 topics. According to the content analysis, the environmental issues addressed by PSC's meetings are the control of various

environmental pollution and the system construction of ecological civilization. It is worth noting that agendas of "politics" primarily denote the study and implementation of Xi Jinping's thoughts and the spirit of important CCP political meetings. Political issues now outnumber economic issues in the agenda space, even though the latter was previously thought to be the preference of local governments. Furthermore, with the exceptions of the economy, agriculture, health and environmental protection, the top ten issues are all related to Party affairs, while the five issues accounting for less than 1 percent are traditional public policy issues. This reflects the distinction between the agenda structure of the core policy venues in a one-party system and those in democracies.

[insert Figure 2 about here]

Variables

The independent variable, according to hypotheses 1 and 2, is the proportion of environmental protection (*PSC_env*) and other issues on the agenda of the PSC's meetings. It should be noted that we will concentrate on the impact of the environment and the three core issues, namely politics (*PSC_pol*), economy (*PSC_eco*), and organizational management (*PSC_org*), on the dependent variable. The reason for paying more attention to core issues is that they are more likely to crowd out non-core issues (Jennings et al., 2011), and will thus enable us to test hypothesis 2. In addition, we used the proportion of environmental protection on the agenda of site visits (*Visits_env*) and written directives (*Directive_env*) of the PPS as independent variables to test hypothesis 3.

Since there are many other factors that affect environmental quality besides agenda-setting, we must find a suitable proxy as a dependent variable, so as to control for the influence of other factors on environmental quality. To this end, we used the monthly air quality of each province, represented by the sulfur dioxide (SO_2) concentration, as a

proxy for the dependent variable. Air quality, especially the concentration of SO_2, can be identified and measured quantitatively and is a commonly used indicator in the political science literature (Bernauer and Koubi 2013; Yi et al. 2018), which is critical for our research. As a major air pollutant, SO_2 emissions are generated by heating, gasoline and diesel combustion in vehicles, and industrial activities; thus, SO_2 emission management frequently involves multiple fields (Xu 2011). Moreover, since SO_2 is the core indicator of China's provincial reduction in air pollution, it has become an important symbol of China's environmental protection as well as a political task to establish local governments' authority (Xu et al. 2009). We obtained SO_2 data from the official website of the Ministry of Ecology and Environment of China.

To control for the impact of other factors on air quality, we also set the following variables: (1) Air quality is closely related to the economic characteristics of each province. Thus, we used the monthly night-time light intensity (*Light*) in each province as collected from the National Centers for Environmental Information (NCEI) as a proxy variable for its level of economic development. Night-time light data are better suited to monthly panel data than indicators like GDP.

(2) The central government's role in environmental protection is determined by China's environmental decentralization system. Therefore, we controlled for the impact of the Central Environmental Inspection System (*Inspection*) in the model. Since December 2015, the central government has been sending inspection teams to the provinces to monitor environmental policy implementation and to hear public complaints about pollution. This system is regarded as China's most significant structural reform in environmental governance in recent years (Li et al. 2020). We coded the month in each province where the central inspection team was stationed as 1, otherwise as 0.

(3) Meteorological conditions are important for pollutant diffusion. Therefore, we collected monthly data on wind speed (*Wind*), maximum temperature (*Max. temp.*) and minimum temperature (*Min. temp.*) in each province from the NCEI as control variables.

(4) Studies have found that the Chinese local government takes urgent administrative measures to control air pollution during politically sensitive periods such as the "two sessions"[2] in order to create a temporary "political blue sky" (Shi, Shi and Guo 2020). Therefore, we set "*Period*" as a dummy variable to control for the impact of politically sensitive periods such as the "two sessions" and the "CCP National Congress" on the dependent variable. Table 1 summarizes the descriptive statistics for all variables.

[insert Table 1 about here]

Model specification

To test hypotheses 1 and 2, we used fixed effects with provinces and months as our panels and robust standard errors. Model 1 is specified as Eq. (1):

$$SO_{2it} = \beta_0 + \beta_1 PSC\_j_{it} + \gamma_1 C_{it} + p_i + m_t + \varepsilon_{it} \quad (1)$$

Where SO_{2it} is the mean of SO_2 concentration in province *i* at month *t*. PSC_j_{it} represents the proportion of issue *j* on the agenda of the PSC's meetings in province *i* in month *t*. C_{it} denotes the control variables. p_i and m_t capture province and temporal fixed effects respectively. ε_{it} denotes normally distributed errors.

For hypothesis 3, we set the model 2 as Eq. (2):

$$SO_{2it} = \beta_0 + \beta_1 PSC\_env_{it} + \beta_2 Visits\_env_{it} + \beta_3 Directives\_env_{it} + \gamma_1 C_{it} + p_i + m_t + \varepsilon_{it} \quad (2)$$

Model 2 estimates the effects of policymakers' environmental protection agendas on the dependent variable. The control variables and fixed effects have the same definitions as

in Eq. (1). The independent variable distinguishes model 1 from model 2. In Eq. (2), we introduced the PPS's attention to environmental issues on the agenda of site visits and written directives.

Empirical Findings

Main estimated results

Table 2 presents the estimated results for hypotheses 1 and 2 based on ordinary least squares (OLS) regression. Consistent with hypothesis 1, the proportion of environmental issues is negatively correlated with the dependent variable, as shown in columns 1 and 5. After including all independent variables in the model, the coefficient value is significant at the 5% level, indicating that an additional percentage point increase in the proportion of the environmental agenda at a PSC meeting is associated with a 0.148 μg per cubic meter decrease in SO_2 concentration.

We also found evidence to support hypothesis 2. As shown in column 5 in Table 2, the rising proportion of "politics" on the policy agenda of the PSC's meetings was associated with worse air quality at the 1% level of significance. However, we found that "economy", "organization management" and other non-core issues had no significant positive correlation with SO_2 concentration.[3] Although the coefficients for "*PSC_eco*" and "*PSC_org*" in column 5 are positive, they are not statistically significant. The results suggest that, while core issues are more likely to crowd out non-core issues, the intensity of this effect varies.

[insert Table 2 about here]

In line with Jennings et al. (2011), in order to reveal the difference in the intensity of the crowding-out effect of the three core issues, we further calculated the information entropy (Shannon's H index) of the agenda space of the PSC's monthly

meetings and conducted a regression analysis of the influence of independent variables on the Shannon H index.[4] As shown in column 5 in Table 3, the proportion of "politics" in the agenda space is negatively correlated with the Shannon H index at the 1% level of significance, and its coefficient value is much larger than that of "economy" and "organizational management", indicating that "politics" has the strongest crowding-out effect on other issues. The findings show that a timely response to and study of the instructions or thoughts of central political meetings, especially those of the top leader, is the "number one" agenda of local governments. Thus "politics" has become the issue that is most highly received in the core policy venue of provincial government and has the most privileged position on a given venue's agenda. Under such circumstances, even if environmental protection is high on the PSC's agenda at a given time, the issue is likely to be squeezed out as political issues flood into the policy venue.

However, although "economy" and "organizational management" are also core issues, they are less prominent on the PSC's agenda than political issues and therefore have a weaker crowding-out effect on other "niche topics". Especially for economic issues, because of China's unprecedented emphasis on green development in recent years, economic development and environmental protection are more likely to appear as "complementary" rather than "either-or" issues in the agenda space. Therefore, a greater emphasis on economic issues does not always imply lower environmental quality.

[insert Table 3 about here]

Table 4 shows the regression results for hypothesis 3. As we expected, we do not find sufficient evidence that attention to the environment on policymakers' agendas affects provincial air quality. The proportion of environmental issues on the site visits' agenda of the PPS is negatively correlated with SO_2 concentration at the 10% significance level (column 1 in Table 4), but this relationship becomes non-significant

after incorporating "*PSC_env*" and "*Directives_env*" into the model (column 3 in Table 4). Furthermore, the PSC's attention to environmental issues still has a significant negative effect on SO_2 concentration when compared with the policymakers' agenda.

[insert Table 4 about here]

Finally, control variables largely work as expected. The night-time light level was significantly positively correlated with the concentration of SO_2, while "*Period*" and "*Min. temp.*" were significantly negatively correlated with the dependent variable. We also find that central environmental inspections had a negative effect on SO_2 concentration, but this effect was not significant after including all independent variables.

Robustness check and endogeneity

We used the following approaches to ensure the robustness of our findings and to address potential endogeneity:

(1) We used the panel correction standard error (PCSE) to re-estimate models to avoid heteroscedasticity and autocorrelation in the long panel data. (2) We re-estimated models using spatial error model (SEM) to avoid biased estimation due to spatial correlative of dependent variable. (3) Taking into account the time lag in the effect of agenda-setting on air quality, we re-estimated model 1 by including the lagged term of independent variables. (4) Reverse causality is a concern in this study. Referring to the existing literature on environmental politics, we carried out two stage least squares instrumental variable (2SLS-IV) estimates, using the official tenure of the PPS as an exogenous predictor of air quality (Guo, 2009; Du and Li, 2021). The detailed description and results of the robustness check are shown in Table S1–S4 in the supplementary material, which demonstrates the robustness of benchmark estimation.

Discussion

Our research revealed that agenda-setting is not only about competition for space on the agenda, but also for the top place. While the manifestations and causes of this "horizontal attention dynamic" have been explored, the policy consequences of issue competition have not been adequately investigated (Edy and Meirick 2018; Green-Pedersen and Mortensen 2010; Jones and Baumgartner 2005). Our study provides empirical evidence that issue competition affects the quality of public goods. Regional environmental quality deteriorates in China when core policy venues of provincial governments give "political" issues the highest priority, because such "top issues" crowd out other issues such as environmental protection. Therefore, the cost of issue competition cannot be ignored. In the policy process, the shift of attention between issues in core policy venues means an adjustment of policy priorities, which will inevitably affect policy implementation and outcomes. In fact, recent research about international relations has yielded similar findings. US presidents' attention to other issues often pulls "foreign policy" off the presidential agenda, which may adversely affect the quality of US relations with its allies (Lindsey and Hobbs 2015).

It is worth noting, however, that not all core issues were linked to poorer environmental quality. Although economic development is also a core issue on the agendas of provincial governments, the emphasis on economic issues had little effect on air quality, owing to differences in the prominence of the core issues on the policy agenda and the intensity of crowding-out effects. Our findings provide a new perspective for understanding how Chinese local governments trade-off economic development and environmental protection in a new institutional environment (Du and Yi 2021). As China has established high-quality economic development and ecological protection as a new strategy in recent years, local governments have begun to transform the traditional GDP-

oriented development model to meet new requirements. In the context of the concept of "lucid waters and lush mountains as invaluable assets" proposed by China's leader Xi Jinping, local authorities must seek a balance between economic growth and environmental protection, thus weakening the crowding-out effect of economic issues on environmental issues.

Additionally, the research findings, which have never been reported in democracies, further enrich the existing knowledge on agenda-setting of authoritarian government (Fan, Christensen and Ma 2022; Yan, Yang and Yuan 2022). On the one hand, we find that the dimensions of issue competition differ between authoritarian governments and democracies. Under China's Party-state system, there is competition not only between core and non-core issues, but also between issues with different attributes, specifically between "political" and "policy" issues. Furthermore, in the agenda space of local governments, "policy" issues frequently take a back seat to "political" issues such as implementing the top leader's instructions and demonstrating local officials' political loyalty, particularly in the context of contemporary China's resurgence of strongman politics (Shirk 2018).

On the other hand, we should critically assess the impact of policymakers' agendas in authoritarian governments. While studies have acknowledged the critical role of local officials in regional environmental governance in China (Kostka 2017), we find that the environmental concerns shown by local officials through site visits or written directives do not significantly improve environmental quality. The findings suggest that the policy process is extremely complex, and local officials are only one piece of the puzzle. Whether the individual agenda of local officials is a kind of "political show" or has a stronger "policy effect," especially in an authoritarian system, must be assessed on a case-by-case basis.

Conclusion

This study aims to improve the theoretical and empirical understanding of how agenda-setting influences policy outcomes. To advance this goal, we estimated multiple linear regression on an original dataset on the monthly policy agenda and air quality in thirty-one Chinese provinces between 2016 and 2021. The empirical results indicate that the environmental quality is affected not only by the attention paid to environmental issues by each province's core policy venue, but also by issue competition in the agenda space. Furthermore, we find no evidence that policymakers' attention to environmental protection, including site visits and written directives, significantly improved regional environmental quality.

This study enriches the literature on agenda-setting, especially issue competition (Baumgartner 2016; Jennings et al. 2011; John et al. 2013). While we know that governments think their policy agendas strategically and actively trade off different issues, we know of no empirical work that specifically evaluates the actual effects of agenda-setting on policy outcomes (Mortensen 2010). This study set out to address this research gap by exploring the impact of agenda dynamics on environmental governance. In addition, in comparison with the literature on issue competition in democratic governments, this article not only presents the dynamics of issue competition in local government under a one-party regime, but also discusses the driving factors behind the issue priorities of local authorities. Our research provides non-democratic cases and data for comparative agenda research.

Our findings also help to arrive at a better understanding of environmental authoritarianism (Eaton and Kostka 2014; Kostka and Nahm 2017; Ran 2017). Our empirical analysis, which is based on a policy agenda perspective, sheds new light on the longstanding debates on the effectiveness of China's environmental governance (Gilley

2012). Our main claim is that higher environmental performance is associated not only with local governments' attention to environmental protection, but also to other competing issues. Therefore, once issues like "politics", which local governments consider to be a higher priority than environmental protection, enter the agenda, the space for environmental issues will be squeezed, which is not conducive to improving environmental governance. Overall, the key points we can draw from this research are that evaluating China's authoritarian environmental governance is a complex task that must take into account the specific context of local governments' decision-making.

This study is an initial attempt to investigate the agenda-setting of non-democratic governments; more comparative studies from democracies are needed to extend our findings. In addition, we hope to attract more scholars to investigate other unanswered questions in this field. For example, how can issue competition between central and grassroots government be understood? How does the higher level's issue preference influence the lower level's agenda-setting? In pursuing these new research questions, there is potentially much to learn about the politics in agenda-setting and policy process.

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[1] The Comparative Agendas Project collects and organizes data from archived sources to track policy outcomes across countries. More information of CAP database can be found at https://www.comparativeagendas.net/

[2] The "two sessions" refers to the annual meetings of the National People's Congress and the Chinese People's Political Consultative Conference in March.

[3] The regression results of non-core issues can be obtained from the corresponding author upon request.

[4] The Shannon's H index is calculated by multiplying the proportion of each policy issue in the agenda space by the natural logarithm of that proportion, and then taking the negative sum of those products. A higher Shannon's H score indicates that the agenda is more evenly distributed across various issues, whereas a lower score indicates that the agenda is focused on a few core topics.

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Tables

Table 1. Descriptive statistics for all variables

VARIABLES	N	Mean	*SD*	Min	Max
SO_2	2232	13.63	11.27	2	171
PSC_env	2232	0.0417	0.0585	0	0.500
PSC _pol	2232	0.155	0.110	0	1
PSC_eco	2232	0.134	0.0959	0	1
PSC_org	2232	0.112	0.0925	0	0.750
Visits_env	2232	0.0590	0.126	0	1
Directives_env	2232	0.0158	0.104	0	1
Wind	2232	4.974	1.009	2.693	10.93
Min. temp.	2232	8.840	11.45	-27.38	27.81
Max. temp.	2232	19.40	10.16	-14.90	35.78
Period	2232	0.0977	0.297	0	1
Inspection	2232	0.0502	0.218	0	1
Light	2232	8.328	10.13	0.0281	46.42

Table 2. Regression results for hypothesis 1 and hypothesis 2

	1	2	3	4	5
PSC_env	-0.197***				-0.148**
	(-2.85)				(-2.05)
PSC_pol		0.242***			0.241***
		(3.82)			(3.59)
PSC_eco			0.067		0.092
			(0.81)		(1.13)
PSC_org				-0.002	0.006
				(-0.02)	(0.08)
Wind	0.027	0.029	0.033	0.032	0.026
	(0.26)	(0.29)	(0.32)	(0.31)	(0.25)
Max. temp.	0.019	0.019	0.019	0.019	0.018
	(1.31)	(1.29)	(1.29)	(1.30)	(1.29)
Min. temp.	-0.059***	-0.059***	-0.059***	-0.059***	-0.059***
	(-4.29)	(-4.31)	(-4.28)	(-4.29)	(-4.30)
Period	-0.688***	-0.701***	-0.676***	-0.677***	-0.707***
	(-16.68)	(-16.93)	(-16.04)	(-15.55)	(-16.07)
Inspection	-0.039	-0.043*	-0.046*	-0.044*	-0.041
	(-1.57)	(-1.74)	(-1.80)	(-1.79)	(-1.65)
Light	0.323*	0.315*	0.311*	0.312*	0.322*
	(2.04)	(2.00)	(1.92)	(1.94)	(2.04)
Constant	2.589***	2.546***	2.583***	2.590***	2.537***
	(10.46)	(10.28)	(10.44)	(10.62)	(10.23)
Observations	2232	2232	2232	2232	2232
R-squared	0.798	0.799	0.797	0.797	0.800
Fixed Effects	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table 3. Regression results on the intensity of the crowding-out effect of core issues

	1	2	3	4	5
PSC_pol	-0.888***				-0.941***
	(-6.94)				(-6.80)
PSC_eco		-0.482***			-0.673***
		(-3.17)			(-4.18)
PSC_org			-0.306**		-0.452***
			(-2.14)		(-2.89)
PSC_env				0.400*	0.130
				(2.03)	(0.61)
Constant	2.173***	2.060***	2.053***	1.999***	2.328***
	(40.79)	(42.47)	(39.82)	(40.21)	(36.38)
Observations	2232	2232	2232	2232	2232
R-squared	0.366	0.333	0.325	0.325	0.325
Fixed effects	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table 4. Regression results on hypothesis 3

	1	2	3
PSC_env			-0.188**
			(-2.72)
Visits_env	-0.060*		-0.055
	(-1.85)		(-1.70)
Directives_env		0.050	0.053
		(1.16)	(1.26)
Constant	2.594***	2.590***	2.594***
	(10.53)	(10.51)	(10.48)
Control Variables	Yes	Yes	Yes
Observations	2,232	2,232	2,232
R-squared	0.797	0.797	0.798
Fixed effects	Yes	Yes	Yes

Notes: Standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Figures

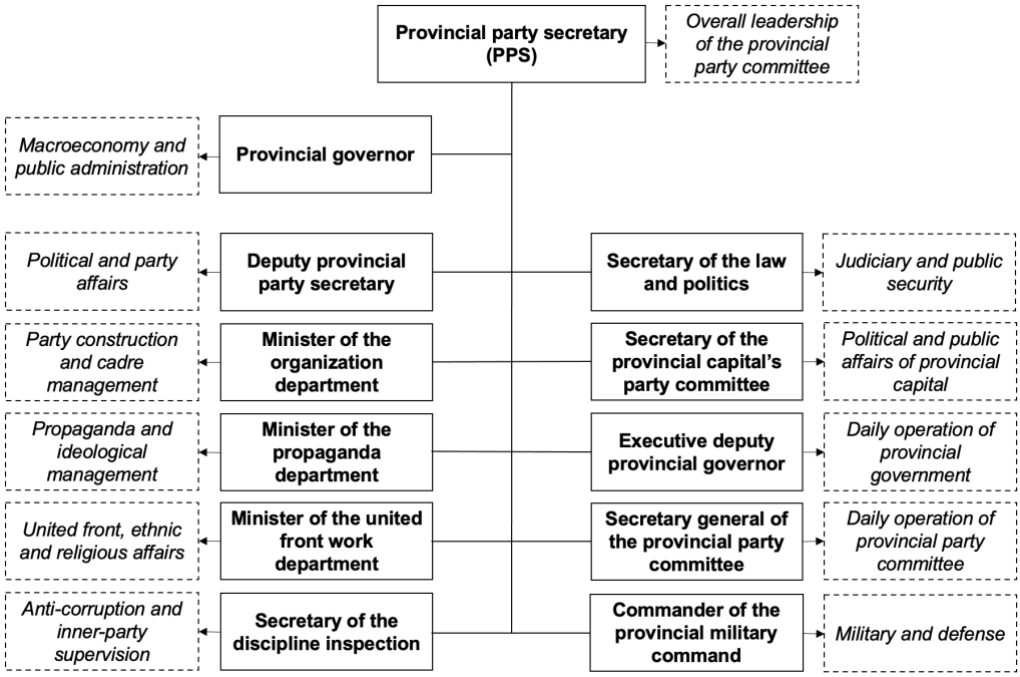

Figure 1. The composition of the PSC and the division of labour.

Note: The dashed boxes show the division of responsibilities among the PSC's members.

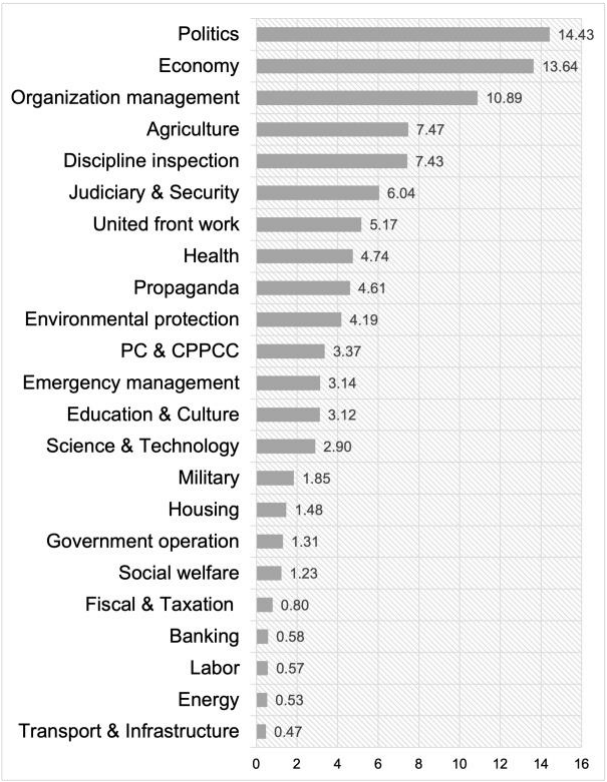

Figure 2. The composition of the PSC's agenda space (%).

Note: People's Congress (PC); Chinese People's Political Consultative Conference (CPPCC).

Appendix A

Table A1. Policy issues and keywords based on content analysis

Policy issues	Keywords (5 high-probability terms)
politics	Xi Jinping, the 19th CCP National Congress, important speech (of Xi Jinping), comprehensively deepen reforms, "Four consciousnesses"
economy	industry, attract investment, economic growth, industrial projects, enterprise
organization management	party organization, party members, cadres, grassroots organizations, party construction
discipline inspection	strengthen party self-discipline, corruption, inspection, discipline, cadres' style
agriculture	agriculture, village, poverty alleviation, farmers, rural revitalization
judiciary and security	stability, public security, judiciary, court, rule of law
united front work	united front, religion, ethnic, democratic parties, unity
propaganda	ideology, propaganda, Marxist theory, media, internet
environmental protection	environment protection, pollution control, air quality, ecological civilization, green development
health	health, epidemic, hospital, public health, sickness
PC and CPPCC	"Two sessions", local PC, legislation, CPPCC members, offer advice
emergency management	disaster, safety, earthquake, rescue, emergency response
science and technology	science, innovation, talent, core technology, double first-class universities
education and culture	education, sports, tourism, teacher, cultural industry
military	defence, military, veterans, civil-military integration, civil air defence
housing	indemnificatory housing, shanty town, urban, community, public facilities
government operation	streamline administration, administrative examination and approval, digital government, public institutions, law-based administration
social welfare	social insurance, medical insurance, elderly services, the disabled, poverty alleviation
fiscal and taxation	fiscal, budget, taxation, audit, local debt
banking	finance, financial risk, financial regulation, bank, corporate finance
labour	employment, migrant workers, entrepreneurship, salary, graduates
transport and infrastructure	railways, transportation, major infrastructure, aviation, port
energy	energy revolution, coal, energy consumption, energy security, energy projects

Note: "Four consciousnesses" is the official ideology proposed by President Xi Jinping aimed at strengthening his leadership authority, which includes the awareness of the need to maintain political integrity, think in big-picture terms, follow the leadership core, and keep in alignment.

Supplementary Materials (Not for Publication)

We conducted the additional analysis listed below to ensure the robustness of our findings and to address potential endogeneity.

First, we used the panel correction standard error (PCSE) to re-estimate models 1 and 2 to avoid potential heteroscedasticity and autocorrelation in the long panel data (Table SI). The results show that the core variable coefficients and significance are consistent with the benchmark regression.

Second, Taking into account the time lag in the effect of agenda-setting on air quality, we re-estimated model 1 by including the lagged term of independent variables. The results in Table S2 show that whether the independent variable is lagged for one month or two months, the impact of the core independent variable "*PSC_env*" on air quality is always significantly negative, while the impact of the variable "*PSC_pol*" is significantly positive. The results consistent with the estimates from the baseline regression.

Third, since the dependent variable in this study may be spatially dependent, we re-estimated models 1 and 2 using spatial econometrics to avoid biased estimation results. Specifically, we first set a spatial weight matrix using the traffic distances of 31 Chinese provinces and conducted spatial autocorrelation test based on Moran I index. After that, we further used the spatial error model (SEM) to estimate the relationship between core independent variables and SO2 concentration. Table S3 displays the results. It demonstrates that the impact of "*PSC_env*" on SO2 concentration remains significantly negative, whereas the relationship between "*PSC_pol*" and dependent variable is still positively correlated at the 1% significance level. The results also suggest the robustness of benchmark regression.

Forth, reverse causality is a concern in this study. Referring to the existing literature on environmental politics.[1] we carried out two stage least squares instrumental variable (2SLS-IV) estimation, using the official tenure of the PPS as an exogenous predictor of the air quality. Studies have found that Chinese local officials prioritize economic development at the start of their tenure in order to demonstrate their competence to superiors as soon as possible. However, as officials' tenure lengthens, the strong incentive to achieve political accomplishment diminishes.[2] Therefore, tenure can influence the issue preferences of local governments and policymakers, but is not directly related to air quality, hence it is suitable to choose this variable as an instrumental variable. The results of 2SLS-IV regression, as shown in Table S4, demonstrate the robustness of benchmark estimation once more.

TABLE S2 Regression results of PCSE estimation

	1	2	3	4	5
PSC_env	-0.197***				-0.188**
	(-2.64)				(-2.51)
PSC_pol		0.242***			
		(4.66)			
PSC_eco			0.067		
			(1.31)		
PSC_org				-0.002	
				(-0.03)	
Visits_env					-0.055
					(-1.55)
Directives_env					0.053
					(1.25)
Constant	0.941***	0.928***	0.960***	0.963***	0.945***
	(4.28)	(4.31)	(4.37)	(4.37)	(4.30)
Control Variables	Yes	Yes	Yes	Yes	Yes
Observations	2232	2232	2232	2232	2232
R-squared	0.889	0.890	0.888	0.888	0.889
Fixed effects	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

TABLE S3 Regression results of SEM estimation

	1	2	3	4	5
PSC_env	-0.189***				-0.182***
	(0.003)				(0.004)
PSC_pol		0.172***			
		(0.001)			
PSC_eco			0.035		
			(0.646)		
PSC_org				-0.011	
				(0.871)	
Visits_env					-0.042
					(0.199)
Directives_env					0.060
					(0.109)
Control variables	Yes	Yes	Yes	Yes	Yes
Observations	2232	2232	2232	2232	2232
R-squared	0.065	0.074	0.070	0.070	0.065
Fixed effects	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

TABLE S4 Regression results of lagged independent variables

	1	2	3	4
PSC_env_{t-1}	-0.118*			
	(-1.87)			
PSC_env_{t-2}	-0.142**			
	(-2.25)			
PSC_pol_{t-1}		0.159**		
		(2.19)		
PSC_pol_{t-2}		0.167*		
		(2.03)		
PSC_eco_{t-1}			0.066	
			(0.75)	
PSC_eco_{t-2}			-0.019	
			(-0.22)	
PSC_org_{t-1}				-0.007
				(-0.12)
PSC_org_{t-2}				0.008
				(0.14)
Constant	3.403***	3.359***	3.396***	3.400***
	(14.67)	(14.67)	(14.74)	(14.80)
Control Variables	Yes	Yes	Yes	Yes
Observations	2170	2170	2170	2170
R-squared	0.783	0.785	0.782	0.782
Fixed effects	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

TABLE S5 Regression results of 2SLS-IV estimation

	First stage Δ*PSC_env*	Second stage ΔSO_2
Δ*Tenure*	0.008**	
	(3.01)	
Δ*PSC_env*		-1.238*
		(-1.66)
Constant	0.012	-0.075**
	(0.84)	(-2.28)
Control variables	Yes	Yes
Observations	2201	2201
R-squared	0.088	0.419
Fixed effects	Yes	Yes

Notes: Standard errors in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

[1] See: Du, W., and Li, M. (2021). The impact of land resource mismatch and land marketization on pollution emissions of industrial enterprises in China. Journal of Environmental Management, 299, 113565; Zhang, M., Tan, S., Pan, Z., Hao, D., Zhang, X., and Chen, Z. (2022). The spatial spillover effect and nonlinear relationship analysis between land resource misallocation and environmental pollution: Evidence from China. Journal of Environmental Management, 321, 115873.

[2] See: Guo, G. (2009). China's local political budget cycles. American Journal of Political Science, 53(3), 621–632.