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A Study of China's Air Pollution Prevention and Control Policy Framework from a Policy Instrument Perspective

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Abstract: Environmental pollution caused by rapid economic development like that seen in China over the past twenty years poses various threats to human health. People have started to place much more of an emphasis on environmental security, working to find a balance between sustainability and economic growth. In recent years, air pollution has emerged as a highly discussed topic of social and environmental relevance in China, due in part to persistent smog that affects everyday life and causes serious harm to human health. Although air pollution is normally associated with human activity, is can be caused by natural processes such as eruptions and forest fires, but is always characterized by the release of certain substances into the atmosphere which, when present in certain concentrations or for given durations, can harm human health, daily life, productivity, and other aspects. In humans, it mainly affects the respiratory system, notably the lungs, as well as the immune system. A series of studies both in China and overseas have shown, in certain cases, even low concentrations of air pollution can pose a great threat to human health. In this study, we conducted an analysis of air quality policies, focusing on the 2018 revision of the People's Republic of China's Law on the Prevention and Control of Air Pollution (LPCAP). We utilized the content analysis method and Strauss and Corbin's grounded theory to construct a policy framework, demarcate analysis units, code and classify policy texts, determine descriptive statistics, and analyze dimensional interactions. We used two dimensions (basic policy instruments classified as demand-, supply-, and environment-side; and air carrying capacity) to quantify and analyze the LPCAP, which enabled us to analyze the deficiencies and conflicts within policy instruments. The results show a higher utilization frequency of environment-side policy instruments, particularly regulation management and strategic measures. This reflects efforts by the government to create a favorable environment for improving air quality. Additionally, supply-side policy instruments are used far less frequently than environment-side policy instruments. Air quality legal policies and pollution control measures mainly consist of environment-side policy instruments; ecological thinking and air quality policies that are based mainly on supply-side and environment-side policy instruments; and social coordination policies that mainly use environment-side policy instruments. Based on the results of this study, we recommend an increase in the number of supply- and demand-side policy instruments, particularly the latter which includes promoting ecological thinking amongst citizens, to optimize and improve air pollution prevention and control policies.

Key words: policy instruments; air pollution prevention and control policy; air carrying capacity; content analysis method; grounded theory

1 Introduction

Air pollution is an undesirable consequence of extensive economic growth. In addition to adverse effects on the social order, production, and everyday life, air pollution poses threats of varying degrees to human health (Song, 1997; Dhital and Rupakheti, 2019). Relevant research in this field

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has had a relatively late start in China, with the first scientific article published somewhat recently in 1974 (Li, 1974). With technological advancement and increasing demand for improvement in quality of life, relevant research evolved from early studies (which merely explored the potential consequences) to factorial studies focused on preventing air pollution, with increasingly diverse research perspectives.

Although several Chinese studies have focused on policy instruments to analyze and explain air pollution prevention and control policies, they have usually been quite general in scope. They have tended to only use descriptive analyses at a superficial level or from a macro perspective and have not commented on the differences between existing instruments. Thus, examining policy instruments alone is an inadequate method to quantify air pollution prevention and control policies or determine the optimal instruments and how to use them in combination. For instance, a study conducted by Wu and Zhao (2018)—based on the degrees of coercion, synergy, and integration in policy instruments—was limited to an investigation of the changes in the air pollution governance instruments in the Jingjinji Metropolitan Region. Similarly, Zheng and Luo (2017) adopted the panel-corrected standard errors model to understand the effects that regulatory, market-based, and voluntary policy instruments have on the efficiency of air pollution governance. Zeng et al. (2016) used 2001–2012 interprovincial panel data for China to analyze the degree to which direct regulatory, market-based, and informal policy instruments inhibit different types of environmental pollution. Feng (2016) systematically analyzed policy change processes from a macro perspective but did not provide any details on the specific policy changes. Harring and Niklas (2015) reported that there are substantial differences between the policy preferences of different countries. These studies contributed to the knowledge base in this area, but this study strives to increase the impact of this research by filling existing gaps and introduce multi-dimensional complexities.

To truly optimize and improve air pollution prevention and control systems, the following issues need to be addressed: classification of the existing air pollution policies into distinct categories, identification of the differences or conflicts between policies in the various categories, and recommendations for what adjustments are needed to improve future policy.

Based on (i) the interactions between policy texts and the objective environment and (ii) an analysis of the policy texts associated with the LPCAP and the objective environment, as observed from a policy instrument perspective, we present solutions to the above-mentioned issues with the aim of developing an understanding of the focal points associated with these policies and identifying the deficiencies and conflicts associated with them. The results of this study should be of significant value to future promulgations, revisions, and improvements to air quality laws and regulations.

2 Methods

Policy instruments, which help decision makers achieve policy goals, are a political gamble as they signify policy-makers making value judgments that contrasts with the assumed policy continuation or status quo (Liu et al., 2012; Gu, 2016). Owen et al. (2001) stated that policy instruments reflect the behavioral styles of a government and represent the mechanisms by which behavioral adjustments are achieved. Accordingly, this study considered air pollution prevention and control policy instruments as the methods and means adopted by a government to protect the fundamental interests of the public, accelerate economic development, and construct a moderately prosperous society in a holistic manner to ultimately achieve the strategic objective of sustainable development.

The specific research approach employed in this study can be described as follows: 1) the determination of the text of air pollution prevention and control policy, 2) the construction of a two-dimensional system and an analysis framework based on policy instrument theories, 3) the coding and classification of the policy content and demarcation of the analysis modules based on the content of the policy texts, and 4) the use of content analysis to measure and analyze the policy tools used in the air pollution prevention and control policy, while exploring any shortfalls and conflicts in the selection, organization, and correlation of the policy tools of the air pollution prevention and control policy, so as to fully understand the composition of the policy, and then proposing corresponding policy measures.

3 Analysis framework for air pollution prevention and control policies

3.1 X-dimension: Basic policy instruments

Based on the policy instrument classification method proposed by Rothwell and Zegveld (1985), we classified the basic policy instruments as demand-, supply-, and environment-side instruments; this classification was then considered the *X*-dimension for the air pollution prevention and control policy framework. Numerous previous studies, conducted in China, have adopted this classification approach. It weakens the mandatory characteristics of policy tools, while strengthening the role of the government as an environment builder in the process of promoting policy projects, and highlights the important role of supply and demand in promoting the development of policy projects. This is in good agreement with the basic principles for promoting the development of air quality governance stated in the current LPCAP. That is to say, by simplifying the administration and delegating power to organizations acting under the government, society and the market can become the main forces acting in the governance allocation of resources for air pollution prevention and control. Therefore, the use of this analytical framework to discuss air quality policies in China is both theoretically sound and practically

feasible. Among the various policy instruments, the supply- and demand-side policy instruments have direct push and pull effects on air pollution prevention and control, while environment-side policy instruments have indirect effects, as shown in Fig. 1.

Environment-side policy instruments reflect the influence and penetration of air pollution prevention and control policy on pollution, and have an ongoing potential indirect impact. Specifically, they provide a favorable policy environment for air pollution prevention and control and indirectly promote development and innovation in air quality governance through the implementation of a series of policy regulations by the government, such as goal planning, financial services, tax incentives, regulations management, and strategic measures (Wang, 2015).

Supply-side policy instruments embody the push effects exerted by air pollution prevention and control policy on pollution. It is the government's role to supply capital investment, technological support, infrastructure construction, information services, and talent cultivation needed to directly expand air pollution prevention and control efforts (Ning and Zhang, 2014), so as to lay a foundation for ensuring the smooth progress of air pollution prevention and control, and then promote the sustainable development of air quality governance.

Demand-side policy instruments are more usually manifested as the pull effects of air pollution prevention and control policy on pollution. It is the government's role to support and draw attention to the air quality governance, by implementing measures such as public technology procurement, service outsourcing, trade restrictions, and overseas exchanges (Zhang, 2012), to reduce the market risk associated with air quality governance, actively develop and stabilize the market for the research and application of new air pollution prevention and control technologies, and reduce external obstacles to the progress of pollution control, such that air quality governance can develop smoothly and effectively.

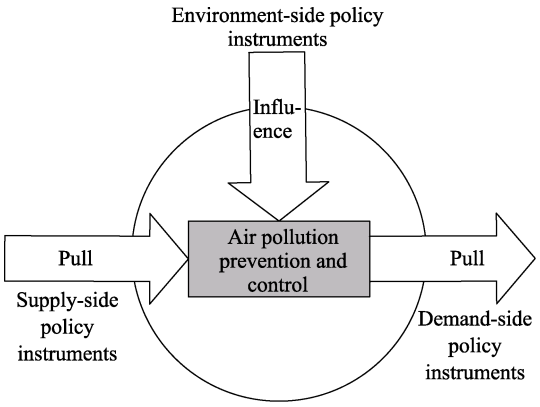

Fig. 1 Flow diagram showing the effects of policy instruments on air pollution prevention and control

3.2 Y-dimension: Assessment of air carrying capacity

Classifications based on a single dimension (in this case, basic policy instruments) are generally inadequate in terms of comprehensively representing all the characteristics of a group of policies. This is especially true for air pollution, which is affected by a wide range of social, economic, environmental, and resource factors. Therefore, the specific dynamics and causes of air pollution—which are key factors for developing air pollution prevention and control policies—must be accounted for.

Owing to China's recent focus on rapid economic growth, environmental pollution has become increasingly severe, with the discharge of air pollutants in many areas far surpassing the carrying capacity of the air. Experts from both academia and industry agree that sustainable development is the best option for the future. Therefore, based on current national circumstances, we chose to assess the air carrying capacity as the *Y*-dimension when comprehensively analyzing and evaluating air pollution prevention and control policies in China.

To determine the indicators required to assess the air carrying capacity, we referred to the results of several previous studies. Liu et al. (2010) developed a regional air carrying capacity assessment system based on air quality, pollution control, and socioeconomic aspects. Further, based on an analysis of the development process and existing problems related to air pollution prevention and control indicator systems used in China, Ji et al. (2015) established an air pollution prevention and control indicator system that considers environmental quality, pollution control, and social coordination. Han (2014) classified air pollution environmental performance audit evaluation systems based on four dimensions, including financial and customer-related indicators, and provided specific assessment indicators for each dimension. Zhao (2004) reported that the construction of systems for sustainable development requires the establishment of ethical environmental concepts based on underlying ecological philosophies, the development of suitable environmental science techniques that ensure sound economic growth, and the improvement of environmental policies and legal systems. Zhang (2009) adopted the pressure-state-response model as a framework for a combined pollution indicator system for air pollution based on scenario analysis. Based on these previous studies, we identified five categories of factors that can be used to measure the air carrying capacity and to investigate the effectiveness of governmental policy: air quality, pollution control, social coordination, air quality legal policies, and ecological thinking.

3.3 Construction of a two-dimensional analysis framework

Grounded theory is rooted in the collected real data, as well as the continuous interaction between data and analysis (Corbin and Strauss, 1990). It emphasizes the formation of a

theoretical model, which is a process of constantly comparing, thinking, analyzing, and transforming data into concepts to build a theory. In this study, the idea of qualitative research was used to transform the data related to air pollution prevention and control into relevant concepts, and based on the judgment criteria for the X- (basic policy instruments) and Y- (assessment of the air carrying capacity) dimensions, a two-dimensional spatial analysis framework for China's air pollution prevention and control policies was developed (Fig. 2).

4 Results and discussion of policy text analysis for the LPCAP from the policy instrument perspective

4.1 Coding of the LPCAP policy content

Content analysis is a combined qualitative and quantitative analysis method that involves systematic quantification of the content being studied and interpretation of the analytical results (Feng and Zhang, 2012). To study the differences and conflicts between the various types of policy instruments, we used the LPCAP as an example and the indicators in the *X*- and *Y*-dimensions as basic analysis units to analyze the policy content of the law. The units included in the content of each article were coded based on the principle that the codes could not be divided further into subcategories. Table 1 lists these specific codes; the detailed content and codes for the majority of the articles have been omitted for readability.

4.2 X-dimensional analysis of the LPCAP

Based on the classification needs of the *X*-dimension, the coded policy units of the LPCAP were classified using the principle of similarity (Table 2). The LPCAP uses a combination of supply-, environment-, and demand-side policy

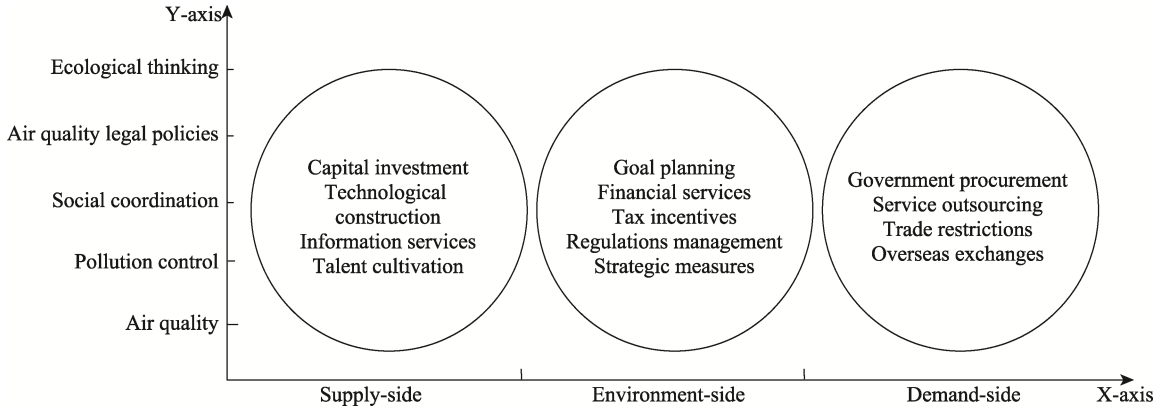

Fig. 2 Two-dimensional analysis framework for air pollution prevention and control policies

Table 1 List of content analysis units and codes for policy texts in the LPCAP

Article	Content analysis unit	Code
1	The Law is formulated to protect and improve the environment, prevent and control air pollution...	1
2	Preventing and controlling air pollution, with the goal of improving atmospheric environmental air quality, insists on treating emissions at their sources, prioritizing planning processes...	2–1
	In the prevention and control of air pollution, we should strengthen comprehensive prevention and control measures such as those aimed at coal, industry, motor vehicles and ships, dust, and agriculture...	2–2
3	The people's government at or above the county level shall integrate air pollution prevention and control efforts into national economic and social development planning...	3–1
	Local governments at all levels shall be responsible for the quality of the atmospheric environment in their respective administrative areas and shall formulate corresponding plans...	3–2
4	The competent department of environmental protection administration under the State Council, in conjunction with other relevant departments of the State Council, shall assess the status for reaching targets to improve ambient air quality and key tasks to control air pollution in provinces, autonomous regions, and municipalities in accordance with the provisions of the State Council...	4
5	The competent environmental protection department of local government at or above the county level shall exercise unified supervision and administration over air pollution prevention and control.	5–1
	Other relevant departments of local government at or above the county level shall supervise and manage air pollution prevention and control within the scope of their respective functions and responsibilities.	5–2
…	…	…
128	The air pollution prevention and control associated with marine projects shall be carried out in accordance with the relevant provisions of the Marine Environment Protection Law of the People's Republic of China.	128
129	The Law shall take effect as of 1 January 2016.	129

Table 2 Article distribution in the LPCAP based on the X-dimension (basic policy instruments)

Type of policy instrument	Name of instrument	Assigned code for the relevant article of the law	Count	Percentage (%)
Supply-side	Capital investment	76-1, 76-2	2	13.33
	Technological support	6, 34-1, 41-2, 76-1	4	
	Infrastructure construction	33-1, 63-2, 79, 81-1, 83-2, 84	6	
	Information services	11, 23-1, 23-2, 24-1, 24-2, 31-1, 38-1, 52-1, 55-1, 69-4, 78-1, 89-2, 91, 95-1, 95-2, 97	16	
	Talent cultivation	N/A	0	
Environment-side	Goal planning	1, 2-1, 21-2, 50-1, 50-4, 67, 68-2, 73, 83-1, 87, 88-1, 129	12	82
	Financial services	50-2	1	
	Tax incentives	50-2	1	
	Regulation management	5-1, 5-2, 7-1, 8, 9, 12, 13-1, 13-2, 14-1, 17, 18, 20-1, 20-2, 26, 30, 31-3, 33-2, 36, 37-1, 38-2…	80	
	Strategic measures	2-2, 3-1, 3-2, 4, 7-2, 10, 14-2, 15, 16, 19, 21-1, 21-3, 21-4, 21-5, 22, 25, 27-1, 27-2, 28, 29, 31-2…	78	
Demand-side	Government procurement	50-2	1	7.14
	Service outsourcing	27-4	1	
	Trade restrictions	27-3, 35-1, 37-2, 40, 44-1, 51-2, 58-2, 65, 85-2, 101, 104, 107-2, 110-1	13	
	Overseas exchanges	N/A	0	
Total	N/A	N/A	210	100

instruments and provides support and encouragement related to numerous aspects of air pollution prevention and control. However, significant differences exist in the degrees to which these three types of policy instruments were applied. Specifically, environment-side policy instruments constitute the majority of the policy instruments used (81.9%), while the supply- and demand-side policy instruments account for merely 13.33% and 7.14%, respectively. This demonstrates a current strong preference of the Chinese government for environment-side policy instruments. Supply-side policy instruments occupy an inferior position in comparison to environment-side instruments and the use of the demand-side policy instruments is scarce.

Among the supply-side policy instruments, service information was dominant (57.14%), followed by infrastructure construction (21.42%) (Fig. 3). The utilization percentages for the other policies were relatively balanced. This indicates that, in the information age, the acquisition and dissemination of information on air quality have become key components in air pollution prevention and control efforts and the Chinese government has placed great emphasis on strengthening these efforts. In addition, China has also increased its investments in infrastructure construction that addresses air pollution, which should aid in advancing sustainable development practices. However, there is still significant room for improvement.

In contrast, there is relatively little utilization of technological support and capital investment, and zero cultivation of talent. With the ongoing development of society, the demands made of technology, capital, and talent, as they relate to the environment, have expanded and therefore require urgent improvements. Among the various environment-side policy instruments available, strategic measures have been utilized to a greater extent in the LPCAP. The frequent use of these policy instruments reflects the emphasis placed on air pollution prevention and control by the Chinese government and the urgency felt to strengthen air pollution governance. Although the purpose of these macro-level policies is to guide sustainable development, certain strategies are fairly ambiguous; this can render them infeasible and consequently result in implementation failure.

The regulation management and strategic measure usage frequencies are comparable at 46.51% and 45.35%, respectively, accounting for the use of nearly all environment-side policy instruments. This reflects China's implementation of strategies for sustainable development with regards to air quality in a planned, systematic manner while focusing on the formulation and improvement of laws, regulations. and policy measures related to the air pollution prevention and control. Financial services and tax incentives each account for only 0.58% of the environment-side policy instruments, which can have strong effects on air quality. In fact, the development of air quality governance not only demands that the government take the lead, but also requires the involvement of other social organizations. Therefore, financial services and tax incentives can serve as effective measures to encourage private sector involvement. Among the demand-side policy instruments, government procurement and service outsourcing each account for only 6.67%, while overseas exchanges are not utilized. The lack of these policy instruments results in the downplay of the overall role of guidance in policies, which suggests that there is ample room

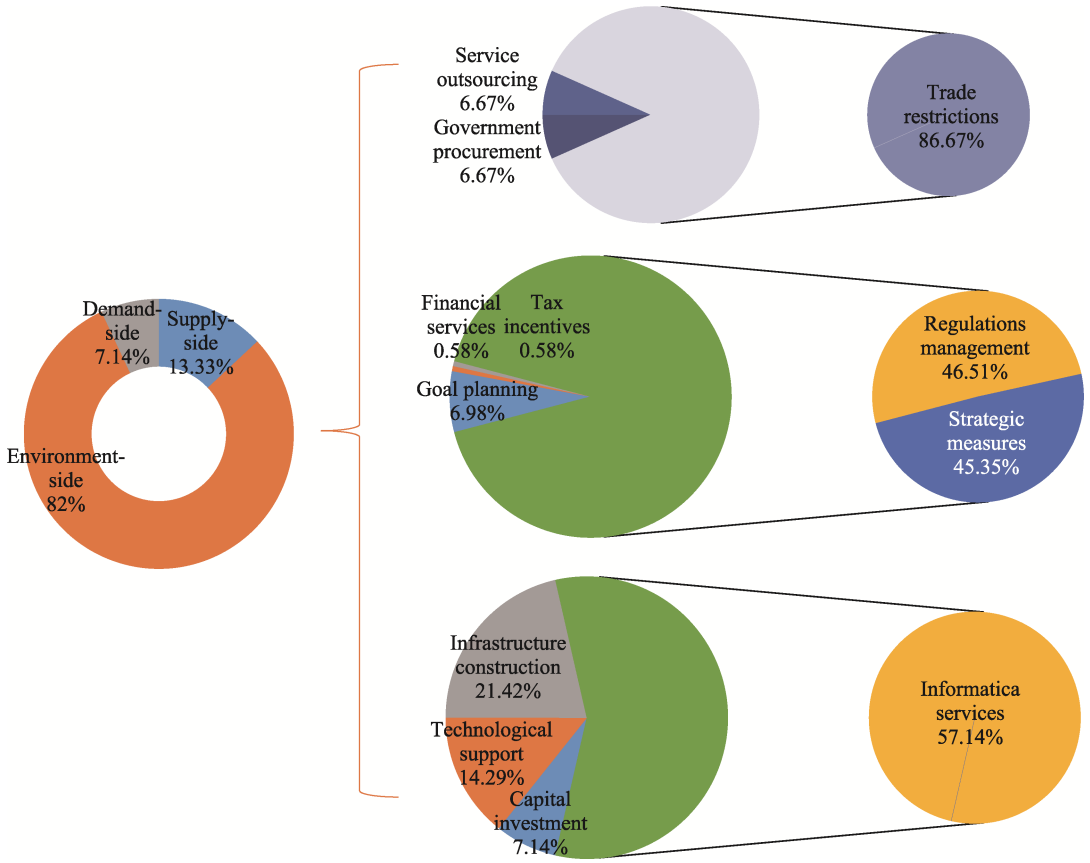

Fig. 3 Utilization percentages of various policy instruments

for supplementation in future promulgations of relevant policies.

The effects of combined policy instruments are the result of multiparty dynamics and continuous interactions, and imbalanced instrument combinations affect the effectiveness of air quality efforts. Therefore, the supplementation and improvement of demand-side policy instruments should be given top priority in future air pollution prevention and control efforts.

4.3 Y-dimensional analysis: Assessment of air carrying capacity

Based on the basic policy instrument dimensional analysis, we quantified the indicators used to assess the air carrying capacity to investigate the effects of the LPCAP and to determine which policy instruments require enhancements (Fig. 4).

Based on Fig. 4, we conclude that the use of supply-, environment-, and demand-side instruments are coordinated—at least at a high level—in the LPCAP. A total of 76 policy instruments are related to the air quality legal policies (36.2% of all policy instruments), followed by pollution control (30.95%), social coordination (20.95%), ecological thinking (8.09%), and air quality (6.19%). This indicates that current Chinese air pollution prevention and control policies are mainly focused on the formulation of air quality legal policies and pollution control, which is in line with the country's national tendencies. Social coordination is also dominant to a certain degree because of China's emphasis in recent years on long-term socioeconomic development. However, our data revealed that the policy instruments related to air quality and ecological thinking account for similar proportions and occupy a relatively inferior position to other instruments. Although air pollution prevention and control have garnered increased attention in China, the focus now needs to move beyond prevention and control efforts. Instead, emphasis should be placed on methods to improve the air quality. In other words, offensive and defensive strategies should simultaneously be adopted. In addition, efforts should also be made to inculcate an ecological conservation consciousness and current ecological thinking in citizens. These two aspects are in particular need of improvement with respect to air quality governance in China.

4.4 Directions for future revisions of the LPCAP

The *X*- and *Y*-dimensions cannot be separated since their interactions explain the multidimensionality and complexity of air pollution prevention and control policies. Subsequent policy efforts and amendments should be implemented with a focus on the combination and balance of these two dimensions.

(1) The utilization frequency of environment-side policy

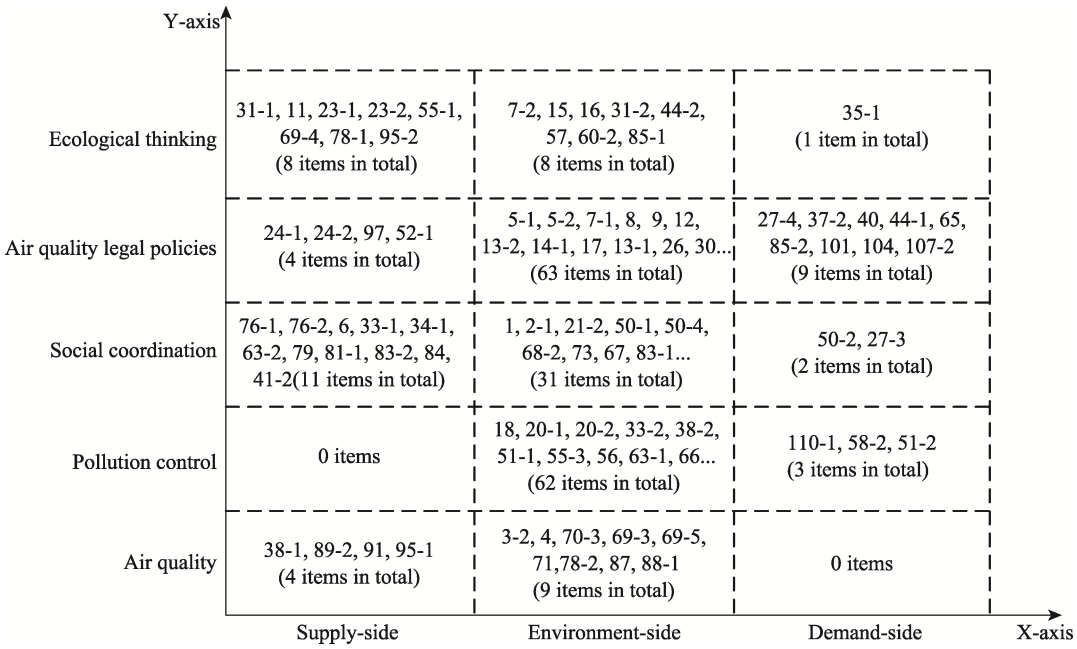

Fig. 4 Distribution of counts for policy instruments in the LPCAP

instruments should be reduced in an appropriate manner and the use of the other policy instruments should be increased. Efforts should be made to ensure that policy instruments, such as goal planning, regulation management, and strategic measures, are properly implemented and strictly controlled while subsequent policies should be tracked in a timely manner to enhance their complementarity. Relatedly, the utilization of policy instruments such as financial services and tax incentives should be appropriately increased to balance the environment-side policy instruments and further leverage their effects.

(2) The push effects of supply-side policy instruments and pull effects of demand-side policy instruments should be enhanced. When selecting supply-side policy instruments, emphasis should be placed on increasing capital investments, introducing advanced technologies, and cultivating professional, high-level talent. In addition, information services should be enhanced for the timely provision of environmental information. With regards to the use of demand-side policy instruments, we recommend that the government increase sustainable procurement efforts, advocate for the outsourcing of services related to air pollution prevention and control, adopt methods, such as patent license trading, technology transfers, and commissioned research and development, to lower the risks and losses related to harmful pollution, and actively promote overseas exchanges to acquire the latest knowledge and information from other countries in a timely manner. These measures will facilitate the development of a pull-focused policy model.

(3) Emphasis should be placed on using the entire diverse set of policy instruments in air pollution prevention and control while focusing on increasing the continuity and integration of these instruments. When formulating air pollution prevention and control policies, the government should maintain consistency in its goals across all policies and ensure that the policies garner comprehensive economic, social, environmental, and resource support, such that the outcome is a win-win situation with respect to environmental, economic, and social benefits.

(4) Policies should be designed in order to achieve goals related to environmental quality. The recent outstanding results achieved for air pollution prevention and control in China do not offer sufficient proof that the latest revisions to the LPCAP are effective. In previous studies, researchers have found that the LPCAP (2000 revision) did not have the expected effect on air pollution prevention and control owing to a lack of strictness (Yang, 2013; Chai et al., 2015; Zhang and Mu, 2015; Zhou and Yu, 2015). These researchers' recommendations were subsequently adopted by lawmakers, which led to greater strictness in the revised 2018 law. However, this did not lead to outstanding results, perhaps because the revision was designed to punish illegal acts rather than achieve goals related to environmental quality, resulting in inadequate improvement in the environment. Therefore, future revisions should be centered around goals for improving air quality.

(5) The barriers posed by litigation to air pollution prevention and control should be eliminated. Determining the causal relationship between injurious acts of air pollution and damage is extremely difficult in lawsuits. Additionally, actors that cause pollution usually possess distinct advantages with respect to resources such as information, capital, and technology, while the plaintiffs, who are typically ordinary social entities, are often faced with difficulties associated

with evidence gathering or protection. This generally results in a failure to get effective results associated with litigation. To ensure fairness for both the plaintiff and defendant, the defendant should bear the burden of proof based on the principle of liability without fault, as well as given the difficulty in proving causal relationships between tortious acts and their damage outcomes.

5 Conclusions

In this study, the content analysis method was adopted to evaluate the policy texts of the LPCAP from a policy instruments perspective. The analysis results clearly highlight the deficiencies and conflicts in the current air pollution prevention and control policies. The conclusions of the study can be summarized as follows:

(1) Basic policy instruments dimension: A higher utilization frequency of the environment-side policy instruments was found, especially of regulation management and strategic measures. This reflects the government's efforts to create a favorable environment for the development of air pollution governance. Despite this fact, certain strategies are too general, ambiguous, and lack detailed methodologies, which reduces their usefulness. Therefore, government departments should establish specific operating rules for relevant regulations. In addition, emphasis should be placed on financial services and tax incentives. By adjusting financial and tax policies, the government can incentivize organizations to make outstanding achievements with respect to air pollution prevention and control. This will encourage active participation of and contributions from various organizations in the development of air quality governance.

Our results also indicated that supply-side policy instruments are used far less frequently than environment-side policy instruments. This has led to an imbalance in the policy instruments and a missed opportunity in the utilization of talent cultivation as a policy instrument. The government must intensify its efforts to cultivate talent to improve air quality, update concepts and models for talent cultivation, expand the channels for capital investments in air quality improvement, continue to raise technological levels, and implement construction projects that prioritize air quality mitigation improvements. Another issue identified in the present study is the severe lack of demand-side policy instruments. Many policy instruments that are known to be effective, especially those related to government procurement, service outsourcing and overseas exchanges, have not been utilized. This shows that air quality governance in China is still in the self-service stage. Therefore, the government should invest in the procurement pf air pollution prevention and control services delivered by professional organizations, aim to attract social capital injection, build an international air quality exchange platform, and introduce advanced practices developed overseas. The combined effects of the supply push effects and demand pull effects provide a more dynamic promotion of air pollution prevention and control compared with those of environment-side policy instruments. Thus, we can consider giving full play to economic means to amend or even eliminate unreasonable mechanisms currently present in the market.

(2) Air carrying capacity dimension: Several previous studies have indicated that achieving the strategic goal of sustainable development through effective air quality governance requires a comprehensive approach (He, 2016). At present, the government is focused on using air quality legal policies, pollution control, and social coordination policy instruments, and little attention has been placed on air quality and ecological thinking. In the future, supply- and demand-side policies should be better utilized to enhance push and pull effects on development.

(3) Interactions between the two dimensions: Our results showed that (i) the air quality legal policies and pollution control employ environment-side policy instruments to a great extent, (ii) ecological thinking and air quality employ supply- and environment-side policy instruments to a great extent, and (iii) social coordination uses environment-side policy instruments to a great extent. In addition to reflecting governmental preferences, these differences reflect the applicability ranges and conditions of the different policy instruments.

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政策工具视域下中国大气污染防治政策框架研究

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摘 要：环境质量与健康休戚相关，现今经济发展所带来的环境污染问题使人体健康受到不同程度的威胁。近几年，持续的雾霾天气让大气污染问题成为了社会热议的焦点，对正常的社会生产生活秩序造成影响的同时也对人体健康造成了极大危害。大气污染是指由于人类活动及自然过程中产生的某些物质释放到大气层，当达到一定时间和强度时，危害到人类健康、生活、生产等各方面的现象，它对人体主要会造成呼吸系统及肺功能与免疫功能的影响危害。国内外一系列的研究表明，有些低浓度的大气污染都可以引发人体的健康反应。为此，本文以大气污染为例，选取《中华人民共和国大气污染防治法》为分析样本，运用内容分析法，基于 Strauss 与 Corbin 的程序化型扎根理论来构建政策分析框架、划定分析单元、编码分类、统计描述、交互分析等，对《大气污染防治法》从基本政策工具与大气环境承载力评价两个维度进行计量与分析，深入剖析大气污染防治政策工具的缺失与冲突。经研究认为，大气质量法制政策和污染控制较多地运用环境型政策工具，生态思维和大气质量更多地运用供给型与环境型政策工具，而社会协调则主要运用环境型政策工具。根据研究结果，本文指出《大气污染防治法》未来的修正路向，以期为大气污染防治政策的优化完善提供政策指引与技术支持。

关键词：政策工具；大气污染防治政策；大气环境承载力；内容分析法；扎根理论