

Application and Development of Grid Governance in Grassroots Governance in China: A Review

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Abstract. As an important innovative model of grassroots governance in China, grid governance has gradually extended from urban management to community services, stability maintenance, prevention and control, and other fields since the pilot in Beijing's Dongcheng District in 2004, and has become the core support for epidemic prevention and control in the post-epidemic era. This paper aims to systematically sort out the literature related to grid governance at home and abroad, and summarize its development trend, core mechanism, and practical dilemma. In this paper, the author uses the systematic literature review method to analyze domestic and foreign studies and finds that grid governance is undergoing an essential transformation from management to governance, and digitalization and intelligence have become the core enabling means, but its operating mechanism in the post-epidemic era is facing new challenges, such as uneven resource allocation and institutional and technological tension. This study not only enriches the theoretical system of grassroots governance but also provides a reference for optimizing the practice of grid governance and improving the efficiency of grassroots governance.

Keywords: Grid Governance; Grassroots Governance; Digital Transformation; Community Management; Post-Epidemic Era.

1. Introduction

Grid governance originated from the idea of the computer grid, and the pilot project of a 10,000-meter cell grid in Dongcheng District, Beijing, in 2004 marked its official entry into China's grassroots governance practice [1]. The Third Plenary Session of the 18th Central Committee of the Communist Party of China clarified grid management as the innovative direction of grassroots governance, making it widely used in community services, social security, emergency management, and other fields. And in the post-epidemic era, its governance value has been demonstrated through practices such as population surveys and isolation control [2]. At present, grid governance has shown significant transformation characteristics, evolving from single administrative control to pluralistic co-governance, with an evolutionary trend from grid management to grid governance, and digital technology and residents' autonomy have become its core development driving force [3]. However, there are still obvious shortcomings in the existing research: there is a lack of research on the adaptive adjustment of grid governance in the post-epidemic era, limited analysis of the deep mechanism of its operational dilemma, and a lack of a systematic framework for effectiveness conditions and solutions [4]. This paper systematically sorts out 12 core literatures at home and abroad, summarizes the research context, core findings, and practical enlightenment of grid governance, and uses classification analysis and comparative research methods to discuss it according to the logic of definition-field-consensus-deficiency-suggestion, so as to provide a reference for subsequent research and practice.

2. Definition of Grid and Grid Governance

2.1 Historical Evolution and Policy Background

Because of the rapid development of urbanization and the huge growth of population, the traditional grassroots management model is difficult to meet the requirements of refined management, and grid management is imperative. The practical exploration of grid management began in 2004

with the urban management pilot in Dongcheng District, Beijing, which enabled refined management of urban affairs by dividing the jurisdiction into standardized grid units [1]. In 2013, the Third Plenary Session of the 18th Central Committee of the Communist Party of China proposed to take grid management and socialized services as the direction to promote its comprehensive extension from urban management to grassroots governance [5]. Under the promotion of policies, grid governance has gradually covered urban and rural communities, forming a four-level governance system of district-street-community-grid, which has become an important starting point for the modernization of the national governance system. In the post-epidemic era, the central and local governments have further strengthened the role of the grid in emergency prevention and control, making it the core link between the government and the people [2].

2.2 Concept Definition and Connotation

The concept of grid governance originates from computer grid technology, and the core is to integrate administrative resources and social forces through the fine division of geographical space to achieve efficient governance of grassroots affairs [6]; At the academic level, its connotation has evolved from management tools to governance models: in the early stage, it was used as an administrative control tool, focusing on information collection and problem handling; In the later stage, the concept of pluralistic co-governance was gradually integrated, emphasizing the collaborative participation of the government, social organizations and residents [5]. In the early research on grids, Zheng and others regarded grids as a management tool based on computer technology, which was managed in the fields of patrol police, street sanitation, and other fields by dividing grids [6], while the current academic circles regard as a governance model towards pluralism and co-governance. This innovative development of connotation has laid a theoretical foundation for the grid to move from administrative management to pluralistic co-governance in grassroots governance practice, and also reflects the development trend of grid application in grassroots governance in China. As the core executive body, grid members undertake functions such as information collection, dispute mediation, and service delivery, which are not only extensions of the governmental authority but also transmitters of residents' needs [3]. Xu & Hepointed out through the W Street case that grid governance is essentially a mechanism for the infiltration of basic state power to the grassroots level, and social stability is maintained through intelligence collection, case coordination, and real-time reporting [7].

3. Different Fields and Categories of Grid Research

3.1 Research on Practical Rheology and Development Trends

This type of research focuses on the evolution and transformation characteristics of grid governance, and the core finding is its transformation trend from administrative control to diversified governance. Zhu compared the cases of Dongcheng District and Zhoushan in Beijing, and pointed out that grid governance has shifted from a single urban management tool to a comprehensive model of integrating management and service functions [1]. Jiang & Jiao emphasized that this transformation is reflected in the transformation of governance concept from control to service and the power logic from one-way to two-way [5]. Its academic significance lies in revealing the innovation path of China's grassroots governance model, but its limitation lies in the insufficient analysis of the dynamic process and regional differences of transformation [8].

3.2 Local Case Studies

Local case studies focus on specific regional practices as objects to analyze the operation mechanism and practical effects of grid governance. Based on the participatory observation of W Street in a second-tier city in southern China, Xu & He found that grid governance achieves stability maintenance goals through three mechanisms: intelligence collection, case coordination, and real-time reporting, but there are problems such as data fraud and task alienation [7]. Chen & Li found

that the amount of tasks, resource allocation, and self-induced resource acquisition ability determine the differences in the implementation strategies of grassroots governments through the comparison of three streets in Y District [9]. The academic value of such research lies in providing empirical support and making it easier to provide realistic and feasible policy suggestions, but the case representation is limited, and it is difficult to cover diverse scenarios across the country [4].

3.3 Research on Technology Governance and Digital Perspective

From a technological governance perspective, it focuses on the enabling role of digital technology in grid governance, and its core is to discuss the great improvement of informatization and digitalization in improving the efficiency of grid governance. Wei et al. pointed out that during the epidemic, technical tools such as health code and cloud platform enabled the grid to achieve precise prevention and control and efficient services [2], while Shao attached importance to the digital transformation of the grid in the post-epidemic era, emphasizing that big data and Internet of Things technology break the information island and build a top-down governance information system [10]. Mittelstaedt argues that although digital technology improves control efficiency, there are also risks of privacy infringement and the squeezing of residents' autonomy [3]. Its academic significance lies in revealing the interaction between technology and governance, and its limitation lies in the lack of research on the ethical dilemmas and institutional adaptability of technology applications [1].

4. Commonality of Existing Research

4.1 Transformation from Management to Governance

With the rapid development of China's economy and society and the increasing progress of digital technology, the economy and society are becoming more complex, and grassroots governance is facing the problems of diversified governance tasks and diverse residents' demands. At this time, grid management has been difficult to meet the needs of efficient governance at the grassroots level, and the rigid model of administrative-led management has also shown huge disadvantages. Grassroots governance urgently needs to evolve from grid management to grid governance. Domestic and foreign studies generally believe that the core evolution trend of grid governance is the transformation from administrative-led management to multi-participatory governance. Jiang & Jiao pointed out that this transformation is reflected in the transformation of governance subjects from a single government to the pluralistic coordination of government, social organizations, and residents [5]; Xu & He found through empirical research that although there are still administrative dominant characteristics in grassroots practice, pluralistic co-governance has become policy-oriented and academic consensus [7]. Chen & Xiao emphasized that the key to the transformation from management to governance lies in realizing the organic connection between grid and community autonomy [8].

4.2 Connotation of Governance Highlights Residents' Autonomy

Existing studies have recognized that resident autonomy is one of the core connotations of grid governance, and have a clear orientation of resident autonomy. Transparent and open information, smooth communication channels, and tasks based on social trust - resource matching mechanisms are all conducive to residents' participation in grassroots autonomy. Mittelstaedt pointed out that grid governance gradually strengthens the function of community autonomy by absorbing residents' participation and unblocking the channels of appeal [3]. Chen & Li found that streets with a high degree of task-resource matching were more likely to promote residents' autonomy practice [9]. Zhu et al. emphasize that grid governance provides platform support for residents' autonomy by reconstructing community relations, but the degree of realization is significantly affected by the degree of administrative intervention [4]. In China, administrative logic still has a high influence, which suppresses the motivation of residents' autonomy to a certain extent.

4.3 Digital Technology Promotes Intelligent Development

Digital technology greatly facilitates the collection of information about residents in the jurisdiction by grid members and enhances the data integration function of grid management. Based on this, the grid can provide accurate services for residents, enhance the control of the higher government over the grassroots, and improve the national certification ability. All studies affirm the enabling role of digital technology in grid governance. Wei et al. pointed out that during the epidemic, digital technology enabled the grid to achieve precise population control and efficient service delivery [2]. Shao confirmed through the case of Sichuan S City that tools such as comprehensive management e-communication and citizen cloud can improve the efficiency of information collection and problem handling [10]. Zhu emphasized that digitalization has realized the transformation of governance from passive response to active foresight, but it is necessary to solve the balance between technology application and humanistic care [1]. The digital divide and privacy risks associated with digital technology also bring major challenges to the digital and intelligent development of grid governance.

5. Existing Research Shortcomings and Prospects

5.1 Insufficient Research on Post-Pandemic Adaptation of Grid Governance

Existing studies have paid insufficient attention to the adaptive adjustment of grid governance in the post-epidemic era. Wei et al. mentioned its application in epidemic prevention and control, but did not deeply analyze the long-term changes in its operation mechanism [2]. Zhu et al. pointed out that the grid in the post-epidemic era is facing new problems, such as resource overdraft and personnel burnout, but relevant research is still at the level of phenomenon description, and there is a lack of in-depth mechanism analysis [4].

5.2 Limited Exploration of Operational Dilemmas and Underlying Mechanisms

Although some studies point out that grid governance has problems such as task alienation and unequal resources, the analysis of the formation mechanism of the dilemma is insufficient. Xu & He found that there is data falsification and task suspension at the grassroots level, but it does not reveal the internal conflict between departmental assessment pressure and governance logic [7]. Chen & Li pointed out that the mismatch between task and resource leads to execution bias, but the institutional deficiencies of resource allocation are understudied [9].

5.3 Inadequate Analysis of Effectiveness and Failure Conditions

Existing studies have mostly emphasized the positive effects of grid governance, but have not paid enough attention to its effectiveness conditions and failure scenarios, and have not clearly quantified quantitative indicators for the effectiveness of grid governance. Mittelstaedt pointed out that the effect of grid governance is affected by administrative logic and social environment, but the specific influencing factors are not clarified [3]. Chen & Xiao believe that resident participation is a key variable, but the research on the causes and solutions of insufficient participation is limited [8].

5.4 Absence of Feasible and Actionable Response Frameworks

Most of the countermeasures and suggestions put forward in the existing research are relatively macroscopic and lack an operational solution framework. Zhu suggested promoting process reengineering, but did not clarify the specific path for the grid to improve governance efficiency through process reengineering [1]. Jiang & Jiao emphasize pluralistic co-governance, but lack details in the design of synergy mechanisms [5]. This makes it difficult to effectively guide practice with research conclusions, and it is urgent to build targeted and realistic solutions [10].

6. Conclusion

Through the above research, it is not difficult to find that the development of grid governance presents three major trends: first, the transformation from management to governance, and pluralistic co-governance has become the core orientation; second, residents' autonomy and pluralistic collaboration are increasingly strengthened, and communities have become the core carrier of governance; third, digitalization and intelligence are significantly empowered, and the integration of technology and institutions has become the key; These trends have effectively improved the efficiency and service quality of grassroots governance, and have become important practices in China's grassroots governance innovation. It is worth noting that the study has both theoretical and practical significance. From a theoretical perspective, this study systematically sorts out the research context of grid governance, fills the gap of grid research in the post-epidemic era, and enriches the theoretical system of grassroots governance. At the practical level, the summary of development trends and dilemmas provides a reference for grassroots governments to optimize policy design, rationally allocate resources, and facilitate digital upgrading, helping to improve governance efficiency and strengthen the modernization of grassroots governance. In the future, the research on grid and grid governance can focus on three major directions: first, in-depth analysis of the operation mechanism and adaptive adjustment of grid governance in the post-epidemic era; second, explore its effectiveness conditions and failure scenarios, and clarify the influencing factors; The third is to build a feasible framework for solving dilemmas and strengthen the operability of countermeasures. At the practical level, it is necessary to optimize the resource allocation mechanism, enhance the deep integration of digitalization and residents' autonomy, balance administrative efficiency and social vitality, and achieve the sustainable development of grid governance.

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