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Policy Spillovers of Environmental Policies: Evidence from Qualitative Research

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Abstract **-** The manuscript investigates the phenomenon of policy spillovers within the realm of environmental governance, highlighting the unintended yet significant effects that environmental policies can have on non-target groups and sectors. It illustrates the intricate interplay between high-visibility policies and low-visibility policies, arguing that understanding these dynamics is essential for national governance. The study incorporates qualitative research methods to analyze three cases, including CIEEP, river chief system and non-waste city, demonstrating that effective policy design should consider not only the intended objectives but also the broader societal impacts. By addressing the role of policy debate, leadership advocacy, and the establishment of trust in facilitating spillover effects, the manuscript provides valuable insights into optimizing environmental policies for enhanced public welfare and sustainable development. Overall, it emphasizes the necessity for innovative thinking and open management practices in achieving comprehensive and effective governance outcomes.

Keywords**:** Policy Spillover, Public Policy, Sustainable Development, Ecological Protection

1. Introduction

Public policy is the core tool of national governance, which objectively requires clear logic and target connotation [1]. However, recent studies have found that while policies improve target behaviors, they also have spillover effects on non-target objects [2-5]. In a complex society, the diversity of governance issues and the interweaving of policy systems often make public policies deviate from the institutional framework of industrial society. Even clear policy designs face the possibility of unexpected consequences, which gives great significance to the study of policy spillovers. At present, most of the research on policy spillovers is concentrated in high-visibility policy areas such as currency and economy, and the research on low-visibility policy spillovers that are difficult to quantify is lagging behind. With the increasing importance of low-visibility policies such as environmental protection and people's livelihood, ignoring their policy spillover effects will not only make it impossible to fully evaluate the policy effects [6], but also the accumulation of non-target effects of low-visibility policies is relatively hidden. Therefore, setting the research object as low-visibility policy spillovers and exploring from the frontier of policy science will not only help to improve the relatively backward theories of policy systematicity and consistency, but also benefit practical problems such as preventing policy systemic risks, coordinating formulation and comprehensively evaluating policy effects.

2. Literature Review

2.1. Area of policy spillover

Different from the theoretical construction paradigm of the policy process, the research on policy spillovers reflects a strong reality orientation, especially the forms of spillovers in the economic, environmental and social fields are more diverse [7]. Economic policy spillover is the most research topic in the existing literature. Its forms include behavioral spillover that has been confirmed by experimental economics, value spillover brought about by goal setting, and bias spillover in which increased diversity in one dimension brings about enhanced perception of diversity in other dimensions [8]. After the financial crisis, the response of emerging economies to the policy spillovers of developed economies has increased, and the spillback effect has become increasingly obvious, especially in China [9]. In terms of environmental policy, one-time environmental behavior will affect people's support for subsequent environmental policies. The form of policy spillover is supportive behavior based on identity, and the spillover effect of voluntary participation is better than compulsive. Policy spillovers also

exist in the social field [3]. For example, after the implementation of the long-term care insurance policy, the labor force participation rate of family caregivers increased significantly [10]. Sentencing has a significant spillover effect on offenders' network members, and the probability that members of the sentenced criminal network will commit crimes in the future is significantly reduced, which indicates that policy spillover in the social field exists more in the form of network conduction [11].

2.2. Influencing factors of policy spillover

The first is cross-border trade, the global financial crisis and international relations. Trade and investment agreements accelerate economic policy spillovers, including by promoting cooperation, which can be attributed to the "beggar-thy-neighbor" effect. The second is national construction and governance capabilities. Good development is the basis for implementing policy initiatives and generating spillovers. Whether a scientific and reasonable quantitative easing monetary policy can be formulated determines whether the policy will generate spillovers. High-quality fiscal and taxation are equally important for policy spillovers [12]. The third factor is the policy issue itself. There are positive spillovers between food, energy and water conservation behaviors [13]. Policy issues are highly heterogeneous, and policy intervention will have a large impact on their spillovers [14]. In particular, there is a special responsive spillover phenomenon in environmental governance (Tang, et.al, 2020). The fourth is other factors such as technology and policy tools. Technology spillovers in intellectual property protection lead to changes in corporate strategies and actions [14]. The policy experiment tool has a positive spillover effect on the selected provinces, and the response effect is also significant (. Environmental innovation policies produce knowledge spillover effects, and the spillover effects of "low carbon" policies are significantly greater than the impact of policy pilots [15]. Regulatory policies such as housing purchase restrictions in large cities exacerbate the real estate bubble and spatial mismatch of land resources in non-restricted areas (Chen & Shen). To further understand the generation mechanism of policy spillovers, Mundell-Fleming-Dornbush (MFD) model reveals the impact of international capital flows on macroeconomic policy spillovers [15]. The International Monetary Fund (IMF) has released the "Spillover Report" for many consecutive years since 2011, confirming the model's explanatory power on policy spillovers in five major economies including China and the United States [16]. Research on policy spillover mechanisms in other fields is relatively weak, but there are also achievements such as the " fixed-effects dynamic spatial Durbin error model" of EU energy policy [17] and the Time-Varying Parameter Vector Auto-Regressive (TVP-VAR) model of increased financial risk contagion between China and countries along the Belt and Road [18].

3. Research Design

Policy spillovers have both positive and negative effects, and an ideal analysis should consider all effects comprehensively. However, this study focuses on China's internal policy spillovers and does not involve international relations intentions that may have more negative effects. In addition, negative effects are gradually being effectively controlled in increasingly scientific modern decision-making. Therefore, this study defines the research object as policy spillovers with positive effects, which is not only in line with the facts, but also helps decision makers to strengthen policy design and share experiences. The research case was selected as environmental policy, not only because environmental policy is highly consistent with the dissipative structure characteristics of policy spillovers, recent studies have generally verified the phenomenon of environmental policy spillovers [19], but also because environmental policy spillovers are mostly concentrated in areas such as people's livelihood, public services, and administrative reforms, which is consistent with the characteristics of low-visibility policies [20, 21].

The cases were derived from the six special rectification areas designated by the Ministry of Ecology and Environment. The annual "Top Ten Environmental Protection" cases of each province since 2015 and the 12 "Special Issues" on the website of the Ministry of Ecology and Environment were used as the database. After removing the cases with high duplication, 47 initial cases remained. First, the "functional, induced, and nurturing" policy spillover types were used to conduct a preliminary selection of cases [22]. Secondly, three policy researchers of associate professors or above from University X were invited to conduct a group discussion. From the initial cases, 3-6 typical cases were

matched for each type of policy spillover, for a total of 16 cases. Then, text analysis and process analysis were used to determine the evidence of the causal relationship of case spillover (Table 1), and the policymakers and non-target groups of of the 16 cases were clarified. Then, 11 experts (5 environmental protection officials, 3 environmental protection social organization workers, and 3 university researchers) were invited to score. The policy spillover degree of the 16 cases was was divided into five levels: "very obvious", "obvious", "average", "not obvious", and "very not obvious", and the values were 1.0, 0.8, 0.6, 0.4, and 0.2 respectively. After two rounds of scoring, the cases with the highest scores in each type were were selected as samples for in-depth analysis. Finally, 5 university researchers in addition to the 11 scoring experts were invited to conduct external consistency tests on the spillover relationships of the three cases, using the formula "consistency = (number of mutual agreements) / (number of mutual agreements + number of mutual disagreements)". The results showed that the consistency of the three cases exceeded 85% (Table 1).

Table 1: Typical cases of environmental policy spillovers and their causal relationships

Policymakers	Non-target group	Consistency	Causal Evidence	Spillover characteristics
CIEEP	Civilized city construction in social field	85.71%	①②⑤⑦	Vertical Evolution
	Anti-corruption and other institutional reforms in the political field	100%	①④⑤⑦	
River Chief System	Forest and garbage management	100%	①②③④⑤⑦	Virtuous Cycle
	Urban street management, field management	85.71%	①②③④⑤⑥⑦	
Non-Waste City	Rural new energy development	100%	①②③⑤	Mutual Initiation

Based on the classification criteria of policy spillover proposed by scholars such as Lindberg, combined with the criteria for judging causal relationships in policy diffusion and transfer in policy similarity research, the study determined three bases for causal judgment of policy spillover through group discussion and comparative induction. First, whether the policy text mentions the impact of the target group (marked as ①); second, the corpus or actions of the policy spillover agent to define the spillover relationship (the three agents involved in proposing policies: officials, social organizations and citizen representatives, experts are marked as ②, ③, and ④ respectively); third, the definition of the causal relationship of policy spillover in media information (media reports, official reports, and literature results are marked as ⑤, ⑥, and ⑦ respectively).

4. Case Study

4.1. Vertical evolution: Taking the Central Inspection of Ecological and Environmental Protection (CIEEP) as an example

The policy spillover of CIEEP is manifested as vertical evolution, which is a chain reaction process of vertical progression to meet the policy expectations at different levels, and pursue the achievement of the ultimate common goal. The policy target area of CIEEP is ecological environmental protection, but it spills over and produces a chain reaction on non-target objects such as civilized city construction and deeper anti-corruption national governance system reform, and ultimately pursues the common goal of building a socialist modern power (Figure 1).

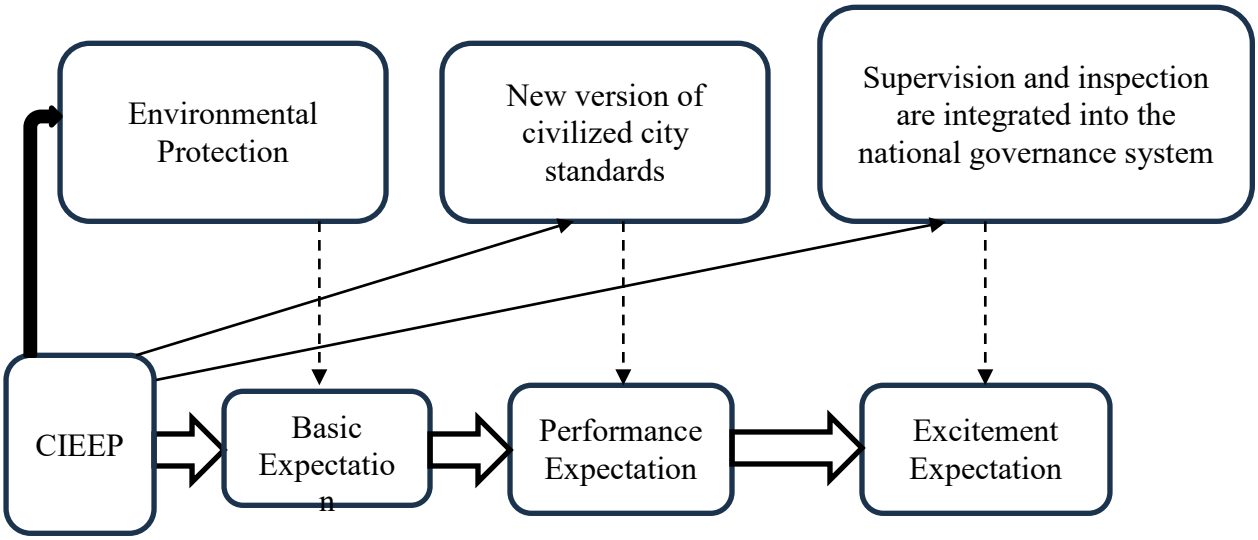

Figure 1. Vertical Evolutionary of CIEEP Policy

The process of vertical evolutionary policy spillover is closely related to the in-depth upgrade of policy expectations. The Kano model divides the expectation levels into Basic, Performance and Excitement. Under the background of "building a socialist modern power with Five-sphere Integrated Plan", CIEEP gradually spills over to social, cultural, political and other expectations of performance and excitement. CIEEP must first meet basic expectations and realize the public's necessary and legitimate needs for a clean-living environment. Performance expectations are an upgrade of basic expectations. Although the requirements are not very demanding or even vague, they can greatly improve public satisfaction and are the driving force that attracts policy makers to seek spillover policies. On the basis of meeting basic expectations, CIEEP's policies spill over to the social and cultural fields, promoting the realization of aspirational expectations such as civilized cities. Under the increasingly intensified feedback pressure of CIEEP, some officials have been held accountable and punished for their poor environmental protection. Local governments have been affected and have begun to transform their social governance thinking, increasing the proportion of environmental protection in the construction of civilized cities. For example, the secretary of Nanming District, Guiyang City, pointed out during a survey in December 2021 that "only by solidly advancing the handling of petitions and complaints from the second round of central ecological and environmental protection inspections can we effectively consolidate the promotion of national civilized cities in the jurisdiction." Sanmenxia City has extended the scope of environmental quality improvement to social civilization construction. Through the "Sanmenxia Daily", 22 batches of various types of mass reports have been collected and handled for public display, and CIEEP has been used to promote the improvement of public satisfaction with social governance. Subsequently, the spillover effect of CIEEP has risen to the national level. The National Civilized City Evaluation System (2021 Edition) has been revised to include "three elements and nine indicators of ecological environment" as the core evaluation criteria, accounting for 1/9 of the evaluation criteria, which has a profound impact on social civilization. The characteristic of excitement expectations is that as long as the government makes a decision, even if the performance is imperfect, it will gain high public satisfaction and loyalty. Political system reform is the adjustment of interest relations based on economic transformation and social and cultural changes. CIEEP meets higher-level excitement expectations, which is reflected in spillover to the political field and promotes governance system reform. For example, in Gansu Province, the policy spillover of CIEEP has promoted the optimization of social governance tools such as administrative law enforcement, and the overall social satisfaction has

reached 98%[1]. When the supervision system has achieved obvious results in environmental protection, economic transformation and civilized city construction, both theory and practice have begun to pay attention to and explore the superiority of the system, seeking to use the supervision system as a starting point in political reform to improve governance governance efficiency. For example, the communiqué of the Fifth Plenary Session of the 19th Central Commission for Discipline Inspection in 2021 proposed to "better integrate the supervision system into the national governance system and and release greater governance efficiency." The antagonistic relationship between the inspectors and the supervised has led led to a new reform of administrative supervision methods. The CIEEP policy has spilled over and become a lever for opening opening a window for political system reform and modern governance in the fields of land resources, clean government construction, public security and justice.

4.2. Virtuous cycle: Taking the river chief system as an example

The policy spillover of the river chief system is manifested as a virtuous cycle, which can be described as a "snowball" effect, and the overall benefits are maximized through circular interaction. The policy spillover of the river chief system began with its good river management results, and then "snowballed" to leverage non-river management goals such as the forest chief system and the bucket chief system, and then crossed over to non-ecological management goals such as the street chief system and the field chief system. The policy experience and reflection of the above policy makers have overflowed and improved the river chief system, achieving a virtuous cycle of interaction (Figure 2).

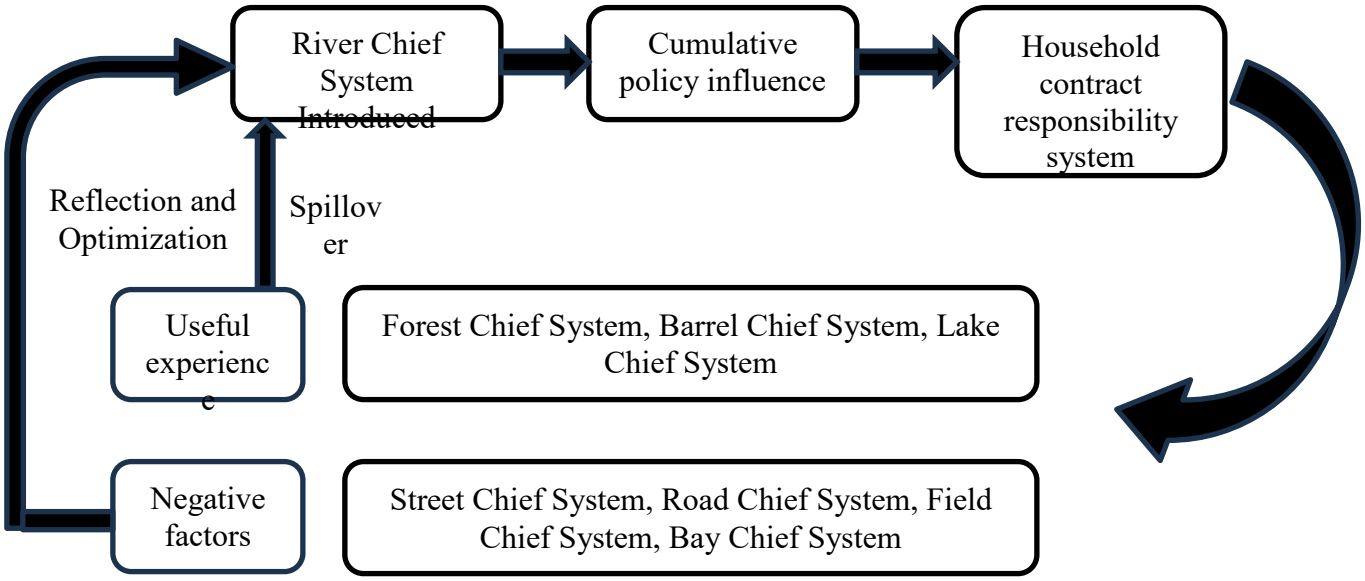

Figure 2. The virtuous cycle policy spillover of the river chief system

Taking Changxing County, Zhejiang Province as an example, this paper analyzes the four cyclical interactive stages of the process of virtuous cycle policy spillover. In 2003, Changxing County, Zhejiang Province took the lead in exploring the "county-town-village" three-level river chief management system, and the river governance effect was obvious. The original policy experience has been repeated, and the good results have accumulated and brought about qualitative changes. Since the implementation of the river chief system, Changxing County has won the highest honor of the river chief system four times, and the county's public satisfaction has ranked first in Huzhou City for many consecutive years. Since 2008, the policy

[1] https://m.thepaper.cn/baijiahao_24251158

effect of the river chief system has received widespread attention, and the "Zhejiang Daily" series of reports on the river chief system has strengthened the compound interest effect. Finally, in 2013, the Zhejiang Provincial Government issued "Opinions on the Comprehensive Implementation of the "River Chief System" to Further Strengthen Water Environment Governance", which clearly stipulated that the river chief is the first person responsible for river governance, and the qualitative change to the "Contract Responsibility System". The "Contract Responsibility System" has been proven to have wide applicability and positive effects, spilling over and promoting the "Forest Chief System", "Barrel System" and "Lake Chief System". For example, the Guangzhou Forestry and Gardening Bureau promoted the of the forest chief system by investigating the river chief system. The river chief system also spilled over to urban and rural governance goals such as the "field chief system" and "street chief system" that are far from the goal of river governance. For example, Changsha County established a "field chief" specifically for protecting cultivated land with reference to the river chief system. The village secretary served as the "field chief" at the village level, and the grid member served as the "field chief" of the grid. Finally, the policy spillover formed a closed loop. On the one hand, the beneficial experience generated by the river chief system for non-target objects during the spillover process will also in turn affect the policy makers, forming a benign interactive closed loop. For example, the problems of supervision failure and lack of normalization in the original three-level river chief system were improved by learning from the experience of the "forest chief system". G, the leader in charge of the river chief system of the Water Conservancy Bureau of Changxing County, believes that the responsibilities of the river chief have changed from the initial management and governance of the river to the current implementation and transmission of the concept of ecological and environmental protection. On the other hand, the negative factors such as "increasing the burden on the grassroots" in the spillover of the river chief system have also been optimized through the reflection of the policy community and continue to affect the circulation system. In 2023, the official account of the Ministry of Water Resources Research Center alone published as many as 31 articles reflecting on the "River Chief System". For example, it mentioned that the river chief system should avoid concepts taking precedence and form over content... It is absolutely forbidden to "give full attention to all arrangements", and the role of grassroots organizations must be played according to local conditions, etc., which has profoundly affected the optimization of the "River Chief System" and other "Chief" systems.

4.3. Mutual initiation: Taking the example of a non-waste city

The policy spillover of non-waste cities is manifested in mutual initiation, interdependence between policymakers and non-target groups, and the essence is the symbiosis of interests of different goals. Taking Ningbo, a pilot city for non-waste city construction, as an example, its non-waste strategy of restricting the development of high-energy-consuming and high-polluting enterprises has generated mutually initiating and reinforcing spillovers with non-target objects of rural clean energy development (Figure 3).

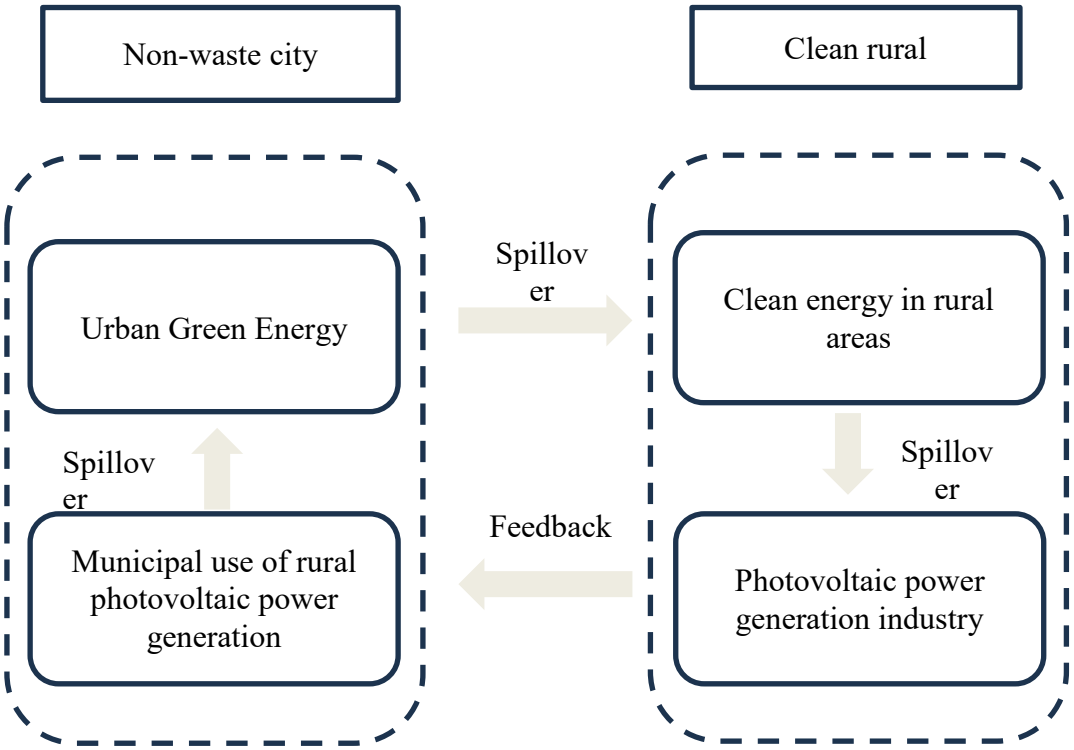

Figure 3. Mutual initiation policy spillover in non-waste city

The process of spillover of mutual policy spillover is full of mutual triggering effects of coexistence targets. No waste cities and clean villages are the two major goals of interdependence and non-waste in environmental governance. In the "Implementation Plan for the Construction of Non-Waste Cities" in Ningbo City, "Rural" is mentioned 11 times, and the relationship between the two has become a close goal and interest community of interests. Prior to 2010, the Ningbo Municipal Government proposed the concept of "enhancing green industries" in the urban industrial planning land, and then had an impact on the non-target objects of rural clean energy development. The person in charge of Ningbo Photovoltaic Project Z brought the advanced urban industrial development green concept into Liyu Village. The then village secretary H believes that rural development and use of clean energy are measures to conform to the green energy of urban green energy, and with the village in the future to adhere to the green concept of the forestry of mountains and forestry, if you do not conspire, you should advocate it vigorously. The first phase of the Liyu Village project is installed on the 315 households to install a 300kW distributed photovoltaic power station. After the second phase of the grid, it can generate more than 500,000 kilowatt -hours per year, which can meet the lighting electricity of 100,000 households a day. The use of clean energy in rural area of Ningbo City is the result of the spillover of non-waste urban policies, but it is also promoting the formation of the rural own green industry. Establishing the use of a clean energy strategy coincides with the first year of domestic photovoltaic in 2014. H was shot with Z, and the latter made Liyu Village the first photovoltaic village in the country through investment construction. At present, Liyu Village has formed a pillar industry of 600 watts of distributed photovoltaic power plants, with more than 600,000 power generation income each year, becoming the first administrative village to build GNS · BIPV full coverage in China. When the rural clean energy industry is formed, it has a strong impact on the target of non-waste cities. The photovoltaic power generation of Li Xuncun has strengthened the goal of non-waste cities. The remaining photovoltaic power of the rural areas has merged into the urban power grid, which has accelerated the reform of the use of electricity and green lighting and cleaning energy for municipal sanitation vehicles. In addition, an overflow effect is also produced inside the waste city. After the use of Liye Village's photovoltaic clean energy, the city also began a large-scale

"zero carbon" transformation operation. For example, the comprehensive energy consumption of Ningbo rail transit operation decreased by 25%.

5. Discussion

5.1. Driven factors of policy spillover

NVIVO12 software is used to open -type encode and obtain 16 initial categories codes (free nodes). On this basis, the main axis coding and selective coding are performed to obtain 6 sub-category codes (sub-nodes), which can be further summarized to the main category (parent codes) of the driven factors of policy spillover (Table 2).

Table 2. Coding of the driven factors of policy spillovers

Main category	Sub -category	Initial categories			Items
		Content of nodes		Number of nodes	
Driven factors	Interaction	Continuous and effective interaction with policymakers M-1	Effective communication between the two sides of policy spillover M-0-1	29	W, a staff member of the Environmental Protection Bureau of City X: “We have set up a regular work liaison group to contact and inspect innovative projects with advanced policies on site.”
			Mutual appreciation among local government leaders M-0-2	31	C, Section Chief of the Political Research Office of the Municipal CPPCC: “Leaders often praise some advanced environmental protection models and encourage us to study and research in those policy pilot areas and places.”
			Regional interaction under competitive relations M-0-3	14	Professor L from Sun Yat-sen University: "In the face of strong and capable governments established in other regions of the same level, we can build a strong and effective market locally'"
	Leadership	Advocacy and mobilization of policy spillover M-2	Official government cooperation agencies M-0-4	20	The Leading Group for the Construction of Beautiful Zhejiang is a policy alliance for river and lake protection, economic and social governance, and calls for the "River Chief System" to spill over into the "Bucket Chief System".
			Influence and advocacy of informal organizational M-0-5	11	L, regional director of the Non-Waste Alliance: "Local government development and reform commissions will contact us to learn how to carry out industrial layout".

			Mass participation and mobilization of the public M-0-6	19	Y, associate professor at Fuzhou University: "Public expectations have a significant effect in increasing or mitigating policy spillovers"
	Trust	Trust and recognition of spillover policies and their effects M-3	Buy-in on deliverables and results M-0-7	33	Staff from the Subdistrict Office of District C, City X: “The district often organizes on-site reviews of outstanding projects. We will also learn from those that are not within our scope of work.”
			Trust in the scientific nature of spillover policies M-0-8	16	M, Office of the Road Chief System of H City: "The National Field Meeting on 'Four Good Rural Roads' has strengthened our confidence in the scientific nature of the 'River Chief System' and the expansion of the 'Road Chief System'"
			Recognition of new opportunities and resources M-0-9	29	B, Party Secretary of Village C, City X: "As cities switch to green energy, hundreds of millions of livestock and poultry in rural areas will follow suit and achieve 'near-zero emissions' because they will all be used to produce biogas."
	Innovation ability	Policy understanding and innovative thinking M-4	Management process and system openness M-0-10	24	Shanghai Yangshan Port Area has set up a main zoning system to allow enterprises in peripheral zones to enjoy the same policies as the main zone, and encourages policy spillover through open management.
			Policy innovation thinking and ability M-0-11	18	"Binhai Release": Tianjin Free Trade Zone pioneered the Five-sphere Integrated supply innovation system, which has a far-reaching impact on the Beijing-Hebei circle and even the China-Japan-Korea Free Trade Zone circle.
			Symbols assist policy interpretation M-0-12	22	The first River Chief System Exhibition Hall provides interactive experience facilities to achieve immersive policy comprehension, understanding, absorbing and mastering the essence of the policy.

	Compulsory	Integration of political authority construction M-5	Political authority promotes integration orientation M-0-13	21	Professor W from the Party School of H City Municipal Committee: "Since the 18th National Congress of the Communist Party of China, the central government has placed special emphasis on integrated construction and accelerated the pace of policy spillovers."
			Reduce the spillover barriers of integration policies M-0-14	10	Former Italian Finance Minister, Greli: "We need to attach importance to promoting the integration process, and we need better and higher-quality supervision to eliminate functional spillover obstacles"
	Interests	Maximizing benefits M-6	The urgency of resolving conflicts of interest M-0-15	26	Y from the Natural Resources Protection Section of H City: "The traditional interests of farmland are intertwined... We can refer to the river chief system and let the 'field chiefs' solve the tough problems."
			Driven to maximize profits M-0-16	19	Associate Professor G from Shandong University of Finance and Economics: The process of European integration is full of policy spillover effects and is the result of maximizing the interests of nation states.

According to analysis, the driver's factors of policy spillover include: interaction, leadership, trust, innovation ability, compulsory, and interests. Interactives include policymakers and non-target groups to maintain effective contact, local governors appreciate each other, and regional policy competition under the competition system. leadership is to induce or stimulate policy spillover through environmental creation methods such as setting up official agencies, informal organizations and public mobilization through environmental impact operations [23]. Trust is the ethical foundation of policy spillover, representing the credibility of the policy, including the actual effects of identification of delivery, the value of trust policies and the scientific content of content, and the recognition policy to bring new opportunities to the non-target group. Innovation ability is a policy formula that adopts new external policies that require innovation capabilities, openness, innovative thinking, and understanding and interpretation of policies. Compulsory is the basic way of policies to exert influence. If you refuse to join the policy spillover, it will be differentiated or losses or losses of interests, and the implementation of compulsory often originated from political authority construction integration and break the barriers. The essence of public policies is the distribution of interests. By introducing external effective policies to resolve internal interest disputes, and maximizing interests are the motivation to occur in almost all policy phenomena including policy spillover.

5.2. "Integration-Difference" Model

The existing literature believes that the influencing factors of the policy spillover cover the logic and channels of enhancing cooperation (Tang, et.al, 2020). It is mainly used to explain the spillover analysis between different countries and regions, and lacks sufficient exploration of spillover mechanisms in the background of the nation with high degree of unity.

Based on this, this study aims to focus on the "integration-difference" model of localized policy spillover focusing on Chinese context (Figure 4). The dimension of the "integration" emphasizes common driven factors, describing the fundamental cause and maintenance conditions of policy spillover, including interests, trust, and innovation capabilities. The "difference" dimension corresponds to the dynamic conditions of the policy spillover, which emphasizes the differentiated action logic of the policy spillover, including interaction, leadership, and compulsory.

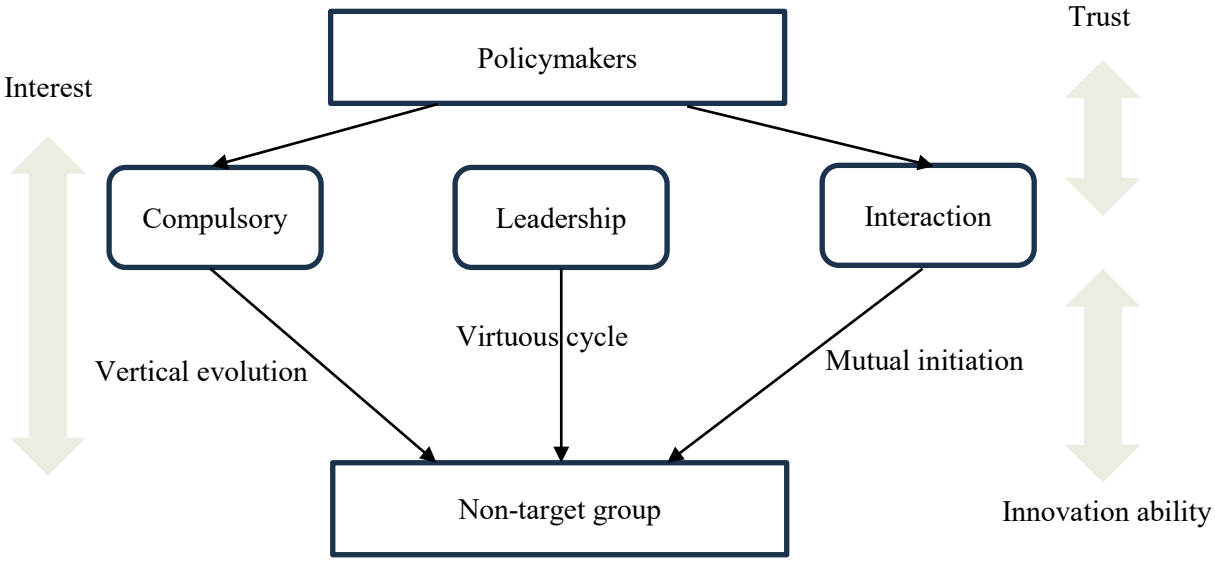

Figure 4. "Integration-Difference" Model of Policy Spillover

According to the statistics of the distribution of NVIVO 12, the elements under the "difference" dimension are reflected in different cases, but the distribution focuses differently. Among them, there are 31 reference points of "compulsory", and the distribution is up to the case of CIEEP (22 points). There are 74 reference points of "interaction", and the distribution is up to the case of river chief system (43 points). There are 50 reference points of "leadership", and the most distributed cases of non-waste cities (33 points). Therefore, in the "Integration-Difference" model, the compulsory, leading, and interaction will be used as the action logic of vertical evolution, virtuous circulation, and mutual policy spillover.

5.3. Mechanism explanation

5.3.1. Driving factors and maintaining conditions of policy spillovers

Interests are the fundamental driving factor for policy spillovers. Policy spillovers originate from the expansion of integration under the guidance of interests. Whether it is vertical evolution, virtuous cycle or mutual initiation, they are actually the product of resolving existing interest disputes and maximizing interests. Policy spillovers originate from the pursuit of the same interest returns [24]. Policymakers adopt external policies used to resolve similar internal interest disputes to obtain interest value. In the context of China's increasing emphasis on regional integration, policy spillovers are more inseparable from the expansion of integration and are the specific actions of the original goal of creating integration [22]. From a holistic perspective, the driving force of integration on policy spillovers is clearer: only when a part of the country follows other parts can it enjoy the full benefits of integration. For example, under the assessment and promotion system of Chinese politics, the successful promotion of the river chief system in Changxing County, Zhejiang Province has brought pressure to other places in the province. If they do not implement the river chief system to integrate, they will not be able to obtain benefits in the assessment, and may even suffer losses. In this way, integration is transmitted from one part to other parts to form spillovers [25]. Therefore, whether it is to maximize interests or to prevent the loss of interests due to non-integration, triggering policy spillovers is a good solution.

Maintaining policy spillovers requires mutual trust. Trust is a very important variable in China's national governance and policy process. President Xi Jinping stressed that we must not allow ourselves to fall into the "Tacitus Trap". Full trust and strong recognition of spillover policies can enable policymakers to focus on long-term benefits and accept short-term losses such as the closure and rectification of some enterprises caused by environmental inspections, thereby increasing the stability of policy spillovers. Whether it is environmental inspections, the river chief system or non-waste cities, strong and sustained trust in policy spillovers mainly comes from three aspects. The first is the recognition of policy results. For example, the smooth operation of the river chief system project, the achievement of goals or good results. In the past ten years since the implementation of the river chief system in Zhejiang Province, public satisfaction with water governance has increased from 68.5% to 90.9%, and the proportion of high-quality water quality above Class III has increased from 63.8% to 97.0% (Data from Department of Water Resources of Zhejiang Province[2]). The second is that the policy content is scientific, clear, reasonable and legitimate. The third is the recognition of new resources and opportunities, such as the cooperation opportunities between urban and rural areas in non-waste cities. Trust needs to be supported by facts to maintain policy spillovers, and some spillover effects take some time to manifest. For example, the river chief system increased the GDP created by each ton of water in Zhejiang Province from 200 yuan to nearly 500 yuan in ten years. In addition, trust is divided into conditional trust and unconditional trust [26]. The quality of unconditional trust is higher than that of conditional trust, and the highest quality of unconditional trust is agile trust, that is, based on past experience and full recognition of the policy target group, a trust relationship is established with strangers in a short period of time. Therefore, whether agile trust can be established after judging the policy effect is a key condition affecting the efficiency of policy spillovers.

Maintaining policy spillovers depends on an open and innovative atmosphere and capabilities. First, policymakers are not stingy in sharing experiences. For example, according to the official website of the Huzhou Water Conservancy Bureau, the River Chief System Exhibition Hall in Changxing County has an average annual audience of more than 60,000 people. Since its opening, it has hosted thousands of River Chief System training courses from 20 provinces, 323 cities, and 708 counties and districts. Secondly, to activate policy innovation, policymakers focus on policy text innovation, strengthen visibility and attractiveness, and non-target groups focus on forming awareness innovation. Thirdly, non-target groups must be able to understand the essence of the original policy. Its core means is policy debate. Even if the results do not meet expectations, the debate process can promote spillovers, and the higher the status of the debaters, the greater their influence, and the more intense the process, the greater the possibility of policy spillovers. Policy debate is a way to achieve low-cost and high-return policy spillovers. For example, the Supreme People's Procuratorate and the Ministry of Ecology and Environment jointly held a seminar on ecological protection and restoration in the Yangtze River Basin, and Anhui and other provinces held 36 hearings and 3 demonstrations, effectively making the influence of environmental protection inspection policies spill over to non-target objects such as the economy and society.

5.3.2. Differences in action: the internal logic that shapes different patterns of policy spillovers

Under the constraints and maintenance of common integration factors, policy spillovers are triggered and maintained. The differentiated spillover patterns after triggering depend on different action logics such as compulsion, guidance and interaction.

Although policy spillovers are non-targeted and spontaneous, compulsion is still an important and effective action logic in the integrated party-political system and governance context with Chinese characteristics. Under the impetus of political authority, non-target groups will adopt policies based on rational compulsion. First, the mode of action of compulsion logic is the promotion of political authority. Political authority is often keen to build integration, thereby accelerating policy spillovers. For example, under the background of the central government's high attention to the "Five-sphere Integrated Plan", environmental protection supervision spilled over to the social, cultural and political fields, accelerating the overall construction of a socialist power. The participation of political authority has gradually politicized the goals and positions of spillover policies, and has a strong expansionary nature. The promotion of policy spillover by political authority will produce a "halo effect", that is, the part is closely linked to the whole. For example, the 20th National Congress of the Communist

[2] https://slt.zj.gov.cn/art/2024/3/14/art_1567479_59041078.html

Party of China used environmental protection supervision as a tool to achieve the civilized development of the entire country. The first step for political authority to promote policy spillovers is to set principles and baselines, so as to promote similar changes in another field that is similar in some aspects, and ultimately maximize the overall interests. Second, the main tools of compulsion logic are command and punishment. In China's pressure-based bureaucratic assessment mechanism and top-down decision-making system, if one does not act in accordance with the will of the coercer, one will face certain adverse consequences. For example, in two rounds of central ecological and environmental inspections, a total of 9,699 people were held accountable[3]. In addition to poor environmental protection, the reasons for the accountability also involved urban and industrial development. It also warned officials who ignored environmental indicators in civilized city governance, and through punishment, it enhanced the spillover of environmental protection concepts into the social and cultural fields. Compulsion logic is not simply driven by administrative orders, but the result of compulsory rationality. Whether the compulsion can be successful depends on the rational decision-making ability of the recipient when receiving the compulsory order. Therefore, the compulsion logic is an autonomous rational compulsion [27].

China's public sector governance is characterized by the integration of administrative leadership and autonomy. Irrational factors such as policy cognitive biases will prevent subjects from making the best decision-making choices, while leadership logic emphasizes helping subjects make more favorable decisions by changing the environment and other means without affecting their autonomy. First of all, the role of leadership logic is not to directly promote policy spillover, but to intervene in the decision-making environment to enable decision-making subjects to make better choices without increasing compulsion and maintaining the subject's autonomy. For example, Changxing County continues to optimize the environment that promotes the spillover of the river chief system, including: the river chief hotline problem resolution rate reaches 100%; the comprehensive score of county-level river and lake managers' performance of duties ranks first in Huzhou City; recreational fishing, wild camping, and water sports , catering, B&B and other business formats have settled in; the proportion of administrative villages with collective economic annual operating income of more than 500,000 yuan has increased from 95.3% in 2020 to 100% in 2024. Significant policy results have created a good reputation and continuously stimulated spillover parties to move closer to spillover policies. Secondly, the main tools of leadership logic are predictive induction and low-intensity stimulation. The similarity between leadership and nudge is to change the subject's decision-making behavior in a predictive way [28]. The premise of effective prediction is that the decision-making subject is boundedly rational and has limitations such as cognitive biases and inherent habit constraints. Reasonable predictions based on the limitations of bounded rationality can often be recognized and then produce strong inducements. In this case, only a low level of incentives or penalties are needed to achieve action. For example, the river chief system in Changxing County directly addresses the problems of unclear rights and responsibilities and fragmented governance in "Nine-Dragon-water-governing", and proposes measures to resolve governance difficulties through clear division of labor and assigning responsibilities to individuals.

The interactive logic is based on symbiosis, integration, compatibility and complementarity, and policy spillovers are generated by establishing a reciprocal network. In the photovoltaic construction of Li'ao Village, from the initial contact between the village and the enterprise to the joint promotion of the village secretary H and Z in charge of Ningbo Guangnian Solar Energy Enterprise, a deep cooperation strategic plan and system for the next 25 years were finally established (Wang, 2023). The profits of the photovoltaic power station belong to the enterprise in the first 12 years, and to the village and the enterprise in the next 13 years. After 25 years, it belongs to all villagers, with an annual profit of about 200,000 yuan. The mutually beneficial and win-win distribution of benefits ensures the basis for symbiosis and coexistence. The key to the interactive logic is to minimize the obstacles to policy spillovers. Flexible and free policy entrepreneurs are always at the forefront of calling for policy needs to be recognized. The activities of policy entrepreneurs are more suitable for reducing spillover obstacles. From the perspective of behavioral motivation, policy entrepreneurs not only put forward policy suggestions, but also like to establish a good reputation. For example, Z, the main person in charge of the Ningbo photovoltaic project, traveled between urban and rural areas and called on Li'ao Village to develop photovoltaic power generation to

[3] http://fanfu.people.com.cn/n1/2023/0728/c64371-40045376.html

revitalize the countryside and supply the city, breaking the policy spillover barrier from the non-waste city to the clean countryside, which is not the target object.

6. Significance and Expectation

The "integration-difference" model of policy spillover proposed in this study is different from the mainstream research that focuses on the results of monetary economic policy spillovers. It innovatively explores the process model and internal mechanism of policy spillovers. At the same time, it attempts to jump out of the "market-economy-politics" research approach and expand the trigger points of policy spillovers to actors outside the market. It has certain applicability in explaining policy spillovers within the country and in local scenarios. Specifically, in terms of actual policy making, the three models of policy spillovers and their generation mechanisms may provide inspiration for decision makers. It urges decision makers to pay attention to the positive or negative effects of policies on non-target objects, regulate them in policy design, and design policy values and target systems based on system principles. It provides ideas for comprehensively evaluating policy effects and tracing the process and causes of unexpected effects. In the complex and ever-changing holistic governance context, policy unexpected effects should be included in policy evaluation as a policy quality evaluation standard. It provides practical reference for preventing policy systemic risks. The spillovers from the central environmental protection inspection, the river chief system, and non-waste cities reveal a chain effect of "one move affects the whole body", but not all policy spillovers are positive. Once negative effects occur, their negative chain effects may bring policy risks and form a thorny systemic dilemma.

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