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From NIMBY to PIMBY: Multi-Logic Governance for Sustainable Waste-to-Energy Facility Siting in Rural China

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Abstract

Waste-to-energy (WTE) infrastructure is central to sustainable waste governance and circular economy transitions, yet its siting continues to trigger Not-In-My-Back-Yard (NIMBY) conflicts worldwide. This study examines how a rural Chinese county converted a WTE project—the only successful one among four siting attempts in its municipality—into a Please-In-My-Back-Yard (PIMBY) facility. Drawing on multi-wave fieldwork (2022–2025), in-depth interviews, and multi-source triangulation of statutory assessments, archives, and monitoring data, we develop a Multi-Logic Governance Framework comprising political, administrative, emotional, and technical logics. We trace a four-stage process from Resistance and Governance Adjustment through Collaborative Consolidation to PIMBY Acceptance, and record measurable outcomes, including over 1400 consecutive days of safe operation under EU emission limits, 28 publicly disclosed statutory approvals, and benefit sharing with nine surrounding villages. The study nuances the authoritarian environmentalism paradigm by conceptualizing relational bureaucracy, offers an actionable alternative to the Decide-Announce-Defend model, and yields practical guidance for siting facilities in transitional economies. Three implications follow: an independent pre-siting risk assessment, benefits linked to village development rather than cash transfers, and a grievance channel paired with disclosure, since disclosure alone did not build trust.

Keywords: rural NIMBY conflict; PIMBY transformation; multi-logic governance framework; relational bureaucracy; authoritarian environmentalism; sustainable waste governance; waste recycling; circular economy; grassroots governance; China

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1. Introduction

Since the turn of the twenty-first century, rapid urbanization has been accompanied by recurring social controversies over the siting of public facilities with negative externalities, making facility siting a major research topic in environmental justice scholarship [1]. Driven by the principle of least resistance, rural areas—characterized by marginalized political and economic discourse power alongside vulnerable environmental carrying capacities—frequently bear a disproportionate share of the environmental costs associated with siting unwanted local facilities, remaining a long-standing focus of global environmental justice studies [1,2]. Developing nations broadly confront this spatial inequality during periods of rapid urbanization and environmental infrastructure remediation, and China is no exception [1]. However, within these rural spaces—long conceptualized as prime arenas for Not-In-My-Back-Yard (NIMBY) conflicts—a shift diverging from classical theoretical expectations has recently unfolded.

These siting controversies are, at their core, sustainability governance problems. Waste-to-energy (WTE) incineration has become a cornerstone of sustainable municipal waste management, converting waste into electricity, reducing landfill dependence, and supporting the transition toward a circular economy. Building such infrastructure is also embedded in the United Nations 2030 Agenda, in which Sustainable Development Goal (SDG) 11 calls for inclusive, safe, and sustainable human settlements and SDG 12 for the environmentally sound management of waste and chemicals. Yet the sustainability dividends of WTE facilities can only be realized if facilities are actually sited and accepted by host communities; public resistance has repeatedly delayed or derailed waste infrastructure projects in both developed and developing countries [3]. Understanding how siting conflicts are governed—and how acceptance can be achieved—is therefore a precondition for delivering the waste-related SDGs in ruralizing regions.

A noteworthy phenomenon is that rural NIMBY disputes in parts of China have recently demonstrated a declining frequency, a shrinking scope of impact, and waning public concern. A suite of public welfare projects that once faced fierce resident opposition—such as waste-to-energy incineration plants, public cemeteries, and mental health centers—has been successfully built and smoothly operated. In certain areas, a distinct transition from NIMBY to Please-In-My-Back-Yard (PIMBY) acceptance has even materialized. This shift suggests that new empirical paradigms are emerging in China's governance of rural NIMBY disputes. Existing literature has largely concentrated on the underlying causes, evolutionary stages, and conflict-resolution strategies of NIMBY disputes, leaving the governance processes behind the shift from NIMBY to PIMBY relatively under-discussed. Why do rural residents move from project opposition to acceptance? What state-led grassroots governance practices make this transformation possible?

Addressing these questions contributes to a deeper understanding of the modalities of NIMBY conflict governance within state-led environments, while offering rich empirical evidence from rural China to the broader scholarship on environmental facility siting and conflict resolution in developing countries. Drawing on the successful operation of a WTE incineration plant in X County, China, as a case study, this paper addresses two interconnected research questions: First, what mutually reinforcing governance practices characterize rural NIMBY conflict management in China? Second, how do these practices unfold in empirical governance to catalyze the transition from NIMBY opposition to PIMBY acceptance?

Among recent studies, Song et al. documented a NIMBY-to-PIMBY transition at a Chinese WTE plant and attributed the reversal primarily to framing and sense-making actions together with substantive compensation [3]. This study differs in two respects. First, rather than explaining the transformation through framing alone, it specifies the full governance configuration—political, administrative, emotional, and technical—that makes such a reversal durable. Second, whereas prior work largely treats acceptance as an outcome, this paper reconstructs the complete four-stage process from resistance to institutionalized PIMBY acceptance and distills transferable pathways for sustainable facility siting in transitional economies.

The remainder of this paper is structured as follows. Section 2 reviews the existing literature on NIMBY conflict governance along three international research strands: state capacity, procedural governance, and institutional trust; risk perception, technical transparency, and technical trust; and rural spatial dynamics, public participation, and emotional support. It then identifies current research gaps and proposes an analytical framework centered on the synergistic interaction of four logics: political, administrative, emotional, and technical. Section 3 outlines the research design, providing justifications for the exploratory single-case study method, explaining the case selection rationale for the X County WTE

project, and describing the data sources and collection procedures. Section 4 presents the empirical case analysis, reconstructing the project's governance trajectory from repeated initial setbacks to stable operation across the political, administrative, emotional, and technical dimensions to illustrate how these four logics unfold in practice. Section 5 expands on the case findings to analyze how the four logics interact synergistically, elaborates on their theoretical implications, and contextualizes the rural Chinese experience within a broader cross-national comparative perspective. Finally, Section 6 concludes the study, outlines policy implications for rural environmental infrastructure siting in developing nations, and discusses research limitations alongside avenues for future scholarship.

2. Literature Review and Theoretical Framework

Scholars globally have undertaken multidimensional theoretical explorations surrounding the causes and governance pathways of NIMBY conflicts. Existing international literature provides rich theoretical resources for understanding facility siting disputes. This paper synthesizes relevant scholarship into three theoretical strands, identifies current research gaps, and formulates our analytical framework.

2.1. State Capacity, Procedural Governance, and Institutional Trust

The first theoretical strand focuses on institutional arrangements and governmental action in facility siting. Traditional top-down approaches often manifest as a closed Decide-Announce-Defend (DAD) model, which readily ignites public discontent and fuels sustained NIMBY resistance [4]. To alter this dynamic, scholars emphasize a transition toward open, participatory governance, mitigating the potential for conflict escalation through early engagement and administrative coordination across governmental tiers [5,6]. In non-Western or state-dominated contexts, this issue is frequently examined through the lens of authoritarian environmentalism, wherein the state leverages robust policy execution and political mobilization capabilities to bypass potential veto points during implementation to achieve designated policy objectives [7]. Concurrently, institutional research indicates that public trust in planning and regulatory agencies shapes risk acceptance, depending largely on whether citizens believe these institutions can act impartially and effectively manage risks [8,9]. While political authority provides baseline legitimacy for state action, a responsive administrative system safeguards procedural norms and addresses public grievances [10]. In rural areas, residents' evaluations of procedural fairness and government responsiveness similarly dictate their risk tolerance. When planning authorities demonstrate technical competence alongside strict adherence to procedural standards, resident risk acceptance increases—laying the groundwork for our subsequent examination of how political and administrative factors interact.

The significance of procedural justice and public participation has been widely examined across diverse political systems. Early public administration research prioritized administrative efficiency as a primary benchmark of governance [11], whereas the New Public Administration movement gradually integrated social equity and democratic responsiveness into the normative core of public governance [12]. In facility siting, early-stage, institutionally guaranteed public participation capable of influencing decision-making is recognized as vital for replacing the closed DAD model, converting facility construction from unilateral mandates into multi-stakeholder negotiations [13]. Environmental justice scholarship further underscores that because rural and marginalized communities bear a disproportionate burden of environmental hazards, procedural fairness and public participation are paramount for fostering risk acceptance in these locales [14]. Recent empirical scholarship similarly reveals that information accessibility and public emission disclosures alleviate NIMBY tendencies [15], whereas siting failures often trace back to local govern-

ments ignoring community grievances [16]. Survey evidence from Chinese incineration projects indicates that environmental impact assessment raises acceptance chiefly through the credibility it confers on the procedure [17]. Network analysis of public–private partnership incineration projects likewise identifies the alignment of local government, enterprise, and village stakeholders as decisive for containing social stability risk [18].

2.2. Risk Perception, Technical Transparency, and Technical Trust

The second theoretical strand originates from the psychology and sociology of risk, positing that public resistance frequently stems from subjective risk perceptions and concerns regarding quality of life rather than objective technical hazards alone [19,20]. When rural communities anticipate that a facility may entail unmitigable environmental impacts or health hazards, these anxieties can be further amplified through the social amplification of risk [19]. Residents' risk concerns are deeply shaped by institutional recreancy and procedural fairness, rather than merely technical hazards [21,22]. For modern WTE incineration projects, this encompasses disclosing environmental impact data, enforcing stringent emission standards, strengthening third-party monitoring, and making pollutant tracking accessible to the public [4,5]. When facility operations can be continuously verified through open-access data, the public acquires a concrete empirical basis for evaluating technical risks. Consequently, an intrinsic connection forms between technical disclosure and administrative oversight.

Risk governance scholarship has further broadened risk communication from unidirectional information dissemination to inclusive public participation in risk deliberation. Subjective risk perceptions are shaped by identity, trust, and perceived efficacy [23]; similarly, public trust in technical experts and facility acceptance depend on whether citizens can actively participate in defining risk [24]. Trust does not depend merely on the volume of information provided, but rather on whether the public views decision-makers as impartial, attentive to public welfare, and competent in risk management [25]. This underscores that reductions in objective risk do not automatically diminish resident anxieties, as institutional credibility and public efficacy jointly moderate risk judgments [26]. Recent empirical studies demonstrate that resident risk perceptions regarding incineration facilities vary according to spatial proximity and the transparency of pollutant monitoring data [15,27], yet disclosure also works unevenly: an experiment found process-based video information yielded only modest perceptual shifts, whose magnitude hinged on prior trust in the information source [28], which indicates that sustained disclosure, rather than a single campaign, builds technical trust.

2.3. Rural Spatial Dynamics, Public Participation, and Emotional Support

The third theoretical strand centers on socio-psychological factors, spatial relationships, and community dynamics in facility siting. Early scholarship heavily debated the use of economic compensation, such as host-community benefit funds or fiscal transfers, to offset facility-induced negative externalities [29]. Subsequent studies revealed that when residents' local place sentiments, cultural identity, and place attachment are overlooked, merely escalating financial compensation does not guarantee community acceptance and may even be interpreted as a form of condescension or bribery [30,31]. Rural communities are far from passive recipients of facility siting; their attitudes are moderated by factors such as facility type, localized development benefits, and the extent of community engagement [22]. Consequently, facility construction mandates broader participatory opportunities for host communities, enhancing public acceptance through empathetic communication and integrated local development initiatives [32].

Within the Chinese rural context, select projects explicitly bundle facility construction with broader rural development—for instance, incorporating surrounding villages into "Beautiful Countryside" initiatives, allocating special land quotas, and subsidizing recreational tourism and community welfare programs. In a traditional "society of acquaintances" (shuren shehui), interpersonal emotional bonds, relational trust, and tangible, perceptible community gains strongly reconfigure residents' attitudes toward infrastructure projects. Because public opposition often stems from a defensive effort to protect living spaces and localized identities, relying solely on financial compensation fails to resolve deeply felt place sentiments; conversely, aligning facility siting with holistic community socio-economic development can fundamentally reframe resident perceptions of the project.

Environmental justice scholarship further critiques the unequal distribution of environmental hazards borne by rural and marginalized communities, highlighting how disadvantaged populations disproportionately carry environmental risk burdens [33]. In siting studies, NIMBY resistance is often conceptualized as a community's protective response against externally imposed hazards; overcoming such opposition requires involving affected residents in decision-making and ensuring they share in project benefits [34]. Literature on economic compensation similarly notes that when cash transfers lack procedural justice and a relational foundation, residents may perceive them as insulting; integrating compensation into sustained, long-term community development arrangements is far more effective in securing acceptance [35]. Recent empirical case studies further reveal that framing and sense-making lessen fierce opposition, whereas tangible, substantive benefits facilitate a shift from passive tolerance to active advocacy [3]. Systematic reviews similarly confirm robust linkages between place attachment, community participation, and energy infrastructure acceptance [36], alongside the moderating effects of social trust and perceived benefits on public receptivity [37].

2.4. Research Gaps

While existing international scholarship offers rich explanations for understanding NIMBY conflicts, three crucial gaps warrant further investigation:

1. Lack of Synergistic Integration: Prior literature frequently examines political authority, administrative procedures, technical governance, and emotional factors in isolation. Discussions regarding how these heterogeneous dimensions interact and operate synergistically within concrete governance processes remain relatively limited.
2. Under-Theorized Rural Contexts: Rural settings demand heightened empirical and theoretical attention. Although scholars have noted that facility acceptance among rural residents differs fundamentally from urban NIMBY activism [22], research on county-level WTE projects still lacks a nuanced exploration of how formal administrative apparatuses and informal rural social networks jointly shape project implementation.
3. Static Outcome Focus vs. Dynamic Process: Existing studies predominantly focus on the underlying drivers of NIMBY disputes or the binary outcome of ultimate project acceptance, leaving the continuous, dynamic process through which residents transition from initial resistance to eventual acceptance under-explained.

To address these limitations, this paper integrates political, administrative, technical, and emotional dimensions into a unified analytical framework. By examining the operational mechanics of these four dimensions throughout the implementation of the X County WTE project, we elucidate how their synergistic alignment drives the attitudinal shift among rural residents from NIMBY opposition to PIMBY acceptance.

2.5. Analytical Framework: A Multi-Logic Collaborative Governance Perspective

When explaining the implementation of unwanted environmental facilities in developing countries, existing studies frequently rely on authoritarian environmentalism as a central theoretical perspective. This theory posits that the state, leveraging political mobilization and administrative execution capacities, can reduce resistance from vested interests during implementation, thereby rapidly translating environmental policies into concrete action [7,38]. While this explanation accounts for why the state can push forward unwanted facility construction, it offers limited insight into how state power actually penetrates local governance processes or how local governments respond to the specific grievances of rural communities. When facilities enter rural societies characterized by weak institutional trust and heightened risk perception, an explanatory gap remains between top-down state project promotion and ultimate public acceptance by residents. Consequently, our core inquiry shifts to how local governance unfolds after state intervention and how heterogeneous governance practices jointly catalyze attitudinal shifts among residents.

Siting and operating rural NIMBY facilities—exemplified by WTE incineration plants—requires addressing four distinct imperatives from initial planning to stable operation:

1. The Imperative of Legitimacy: Because facilities are mandated by higher-level authorities and sited locally, host communities must comprehend why the project serves the broader public interest and why local governments actively champion it [14].
2. The Imperative of Procedure: Even when a project carries public interest attributes, a closed DAD approach risks triggering resident resistance; hence, an open, responsive administrative process is essential [4,13].
3. The Imperative of Identity: In rural societies, formal legal statutes and administrative directives cannot fully alleviate resident anxieties regarding their living environments and local social bonds; relational networks and emotional communication strongly shape how residents perceive the project [22,30].
4. The Imperative of Credibility: For technically sensitive facilities, residents evaluate project risk through continuous, verifiable safety performance, where public emission disclosures directly dictate risk assessments [19,20].

These four imperatives correspond respectively to political, administrative, emotional, and technical governance demands, forming the four analytical dimensions of this study.

To operationalize these four analytical dimensions, this paper conceptualizes them as four distinct governance logics, contextualizing their precise meanings within our empirical setting:

Political Logic: Refers to the state legitimizing facility siting as a component of the overarching public interest through Party leadership and political mobilization, thereby granting political legitimacy to project execution. In our case, this is primarily manifested through grassroots Party organizations orchestrating implementation and framing the livelihood project around broader public welfare.

Administrative Logic: Denotes the government translating unilateral administrative mandates into publicly accepted project arrangements through procedural design, transparent communication, and responsiveness to resident grievances [10]. In our case, this encompasses streamlined approval workflows, comprehensive information disclosure, and continuous state-citizen dialogue.

Emotional Logic: Involves state and community actors constructing citizen trust in both the project and governance agents through interpersonal networks in acquaintance societies, daily social interactions, and empathetic communication [39,40]. In Chinese rural society, this dynamic is deeply intertwined with relational networks (guanxi) within a "society of acquaintances" [41], while bundling facility construction with collective village welfare.

Technical Logic: Entails enabling residents to evaluate facility operations based on verifiable environmental metrics achieved through stringent pollution control, environmental monitoring, and open-data disclosures [19]. In our case, this manifests as adhering to elevated emission standards and publishing real-time environmental monitoring data to the public.

Building upon these four dimensions, this paper establishes a Multi-Logic Governance Framework to systematically analyze the governance process driving the rural NIMBY-to-PIMBY transformation. The political, administrative, emotional, and technical logics address the core imperatives of legitimacy, procedure, identity, and credibility, respectively. Interconnected throughout the empirical governance process, these four logics collectively form our analytical foundation for explaining how the X County WTE plant transitioned from fierce project deadlock to stable operation. Utilizing this integrated framework, we examine state-led steering, procedural governance, emotional bonding, and technical governance within a unified case narrative, uncovering how these synergistic logics reconfigure resident attitudes and reshape project trajectories (see Figure 1).

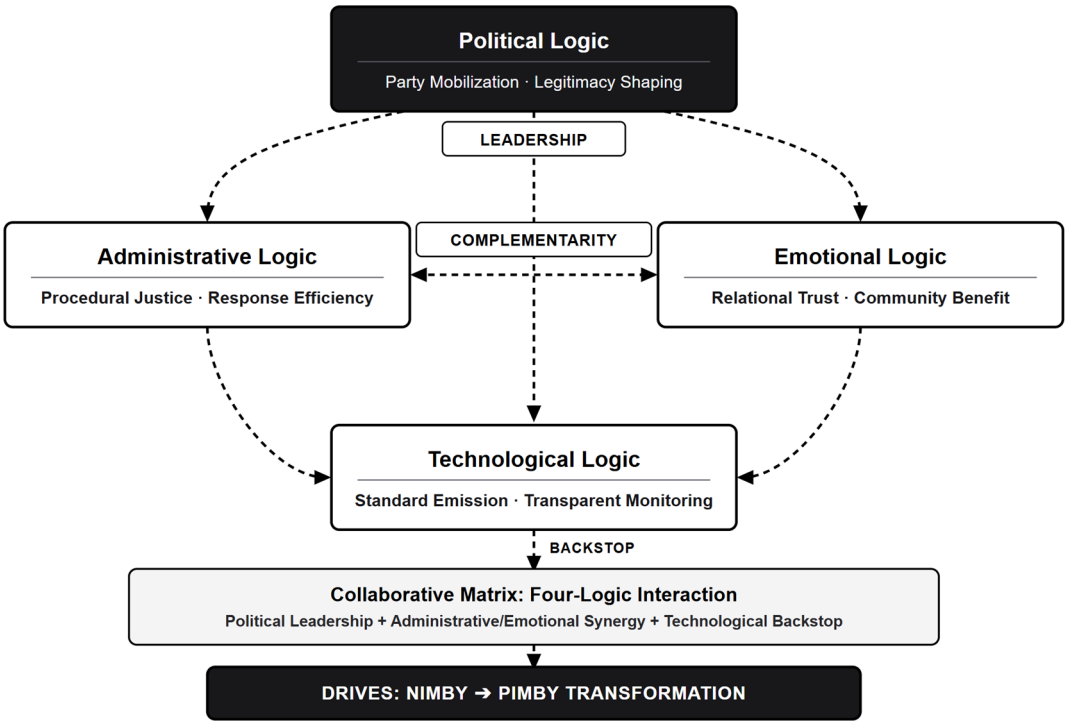


Figure 1. Multi-Logic Governance Framework.

Political logic sits at the apex, and three dashed arrows marked LEADERSHIP carry its authorization downward without prescribing the content of the other three. Administrative and emotional logics share a tier, joined by a double-headed arrow marked COMPLEMENTARITY, because procedure gives relational work a formal channel and relational work keeps procedure attuned to local conditions. Technological logic enters last, marked BACKSTOP, and it fixes the floor below which operation cannot fall through standard emission performance and open monitoring. All four converge in the Collaborative Matrix, from which a single arrow, DRIVES, reaches the transformation. The arrows carry three relations: authorization, complementarity, and constraint.

Because the four logics overlap in practice, their boundaries need a decision rule. A practice is classified by the resource it draws on and by the failure it forestalls, whether withdrawal of authorization, a defective procedure, a broken relationship, or discredited data. Where an event serves two logics at once, as a networked emission screen serves both

transparency and verification, it belongs to the logic whose characteristic failure it prevents. A practice that fits none of the four points to a gap in the framework.

The framework can fail in three ways. Acceptance may hold with one logic absent throughout, may collapse with all four in place, or the weight of the logics may prove constant across settings, which would reduce the framework to a checklist. The case reported here is consistent with it and does not by itself establish it.

The set remains open. A further logic can be admitted where a case displays a distinct imperative, a distinct set of actors, and a distinct repertoire, and where the addition alters how the existing four operate. A fiscal logic becomes separable where intergovernmental transfers determine site choice; an electoral logic where local leaders face competitive contests. A dimension that restates an existing imperative under another name adds nothing. The four logics are a working set justified by this case, subject to revision.

3. Research Method and Case Selection

3.1. Research Design and Case Rationale

This study adopts an exploratory single-case study design. Case study methodologies are uniquely equipped to capture the embedded socio-institutional contexts of policy implementation, leveraging historical process-tracing and multi-source data to unveil dynamic governance mechanisms that quantitative surveys cannot easily isolate [42]. Rather than testing pre-formulated hypotheses, exploratory case studies advance theory-building by tracing processes within unique or revelatory phenomena [43].

We selected the WTE incineration plant project in HK Town, X County, Y City as our analytical case based on three main criteria:

1. High Research Value: Y City attempted four siting projects between 2008 and 2021, and only the last was completed. The same city, waste stream, and governing apparatus produced three failures and one operating plant, and that comparison makes the conditions of success observable. The fourth attempt also proceeded without a single large-scale mass incident.
2. Distinctive Conflict De-escalation Dynamics: Mild resistance manifested during construction—including individual villager blockades, localized road closures, and protest banners—yet these actions were successfully prevented from escalating into large-scale unrest. Throughout implementation, local authorities deployed a diverse repertoire of governance practices, yielding fertile empirical material for analyzing how state interventions shape shifts in public attitudes.
3. Favorable Data Accessibility: Our research team established direct contact with key leadership in X County and diverse project stakeholders. This rapport enabled us to gather extensive primary interview data, project archives, and administrative documentation, which were systematically triangulated to ensure empirical rigor and validity.

3.2. Case Background and Project Trajectory

Located in central China, Y City spans an area of approximately 5005 square kilometers with a permanent population of 2.709 million (a population density of roughly 539 persons per square kilometer). The urban core alone generates over 800 metric tons of municipal solid waste daily. The city's primary municipal landfill had been operating beyond design capacity for nearly two decades, nearing total closure and plunging both urban and rural areas into a severe "waste siege" crisis. To break this impasse, local authorities had attempted three earlier siting projects, none of which was completed. As waste volumes continued to climb, traditional disposal methods proved unsustainable, prompting the

municipal government to launch a fourth attempt in 2017 in HK Town, X County, which ultimately succeeded.

The HK Town project in X County was planned and executed under stringent, state-of-the-art parameters. Phase I spans 117 mu (approximately 7.8 hectares) with a daily processing capacity of 1200 tons and a total investment of roughly 744 million RMB. The site is planned for 1800 tons per day in two phases, of which only the first is built. Flue gas purification complies with the emission limit values of Directive 2010/75/EU, the EU Industrial Emissions Directive. Designed, at its guaranteed lower heating value, to process approximately 438,000 tons of waste and generate approximately 156 million kilowatt-hours of electricity, delivering about 131 million to the grid annually, the facility serves both urban Y City and rural X County. Waste management pressures made the project unavoidable and forced the local government to rethink its strategy for mitigating the recurring public resistance seen in previous attempts.

As the fourth and currently sole successful siting attempt in Y City, the HK Town project progressed through three sequential phases:

Phase I: Decision-Making and Mobilization (2017–2018). In July 2017, the Y Municipal Party Standing Committee formally decided to site the project in X County, establishing a specialized Project Command Headquarters in September. In April 2018, after screening 26 candidate sites across the county and completing 23 rounds of expert panel evaluations, the county fixed the site at HK Town. A county-wide mobilization conference was then convened in Y City, bringing together departmental heads, township leadership teams, and Party secretaries from all 365 administrative villages to launch the mass-work campaign. In September 2018, the Provincial Department of Housing and Urban-Rural Development issued the official site selection approval.

Phase II: Conflict and Governance Adjustment (2018–2021, Pre-operation). Following project disclosures, select villagers began expressing opposition due to limited understanding of WTE technology and lingering anxieties from previous project failures. Starting in 2018, localized NIMBY resistance emerged, including opposition led by individual villagers, nightly road blockades between 7:00 PM and 9:00 PM by small groups, and the posting of opposition banners. However, these actions never coalesced into mass gatherings. The local government organized 25 batches of visits to operating WTE facilities in other regions, drawing about 5100 visitor trips, publicly disclosed 28 statutory approval procedures, and maintained continuous dialogue regarding land acquisition, public welfare measures, and oversight mechanisms. The main structural construction was completed in December 2020, followed by ignition testing in June 2021.

Phase III: Commissioning and Commercial Operation (2021–present). The plant took its first load of waste in 2021, was synchronized to the grid in September, and entered commercial operation in October after the 72 h plus 24 h continuous trial run. The municipal landfill that had served the city since 2003 closed in September, having received 5.18 million tonnes. By mid-2026 the plant had processed 2.08 million tonnes and generated 1.01 billion kilowatt-hours; an ultra-low emission retrofit now under preparation is designed to lower average daily nitrogen oxides from 180 to 80 mg/m^3 on completion.

This trajectory provides a clear chronological baseline for our analysis. The four governance logics examined in this paper—political, administrative, emotional, and technical—were primarily concentrated during the mobilization and conflict governance phase (2018–2021), whereas the stable operation observed since late 2021 represents the outcome generated by these earlier interventions. The subsequent empirical case analysis unfolds along this chronological sequence.

3.3. Comparison with Three Failed Siting Attempts

The fourth attempt shares a city, a waste stream, and a governing apparatus with the three that failed. What differs is the sequence in which information, participation, and approval reached the affected population (Table 1).

Table 1. Four siting attempts in Y City, 2008–2021.

Dimension	Attempt 1 (2008)	Attempt 2 (2009)	Attempt 3 (2013–2014)	Attempt 4 (2017–2021)
Facility and capacity	New sanitary landfill	WTE plant at a disused explosives depot	WTE plant, 2000 t/day	WTE plant, 1200 t/day (Phase I; total planned 1800 t/day)
Location relative to the urban core	Peri-urban township	Mining township	Development zone upwind of the city; 1.8 km from 30,000 residents and 2.6 km from a university campus	Rural township, remote from the urban core; low density
Decision and disclosure	All pre-construction approvals completed; entry announced at short notice	Feasibility study and environmental impact assessment (EIA) approved in June 2009; preparatory work under way	Concession signed December 2013; disclosed online in January 2014; planning notice posted April 2014	26 candidate sites and 23 expert panels; 28 approvals disclosed before construction; open letter to residents September 2018
Public participation	No hearing recorded	No hearing recorded	Hearing held August 2014, after construction had begun; 19 of 25 participants opposed	Siting hearing 17 May 2018, before the 30 May decision (20 delegates, 16 recommendations); 25 batches of plant visits; community supervisors after operation
Procedural standing	Approvals complete	Approvals complete	Construction began without a planning permit; stop-work order issued May 2014	All approvals completed by April 2019; construction started December 2019
Outcome	Abandoned	Abandoned after sustained opposition	Halted in May 2014; not resumed	Operating since 2021; no petitioning (xinfang) over land acquisition or resettlement

Sources are limited to three categories, namely the research team's fieldwork records, official websites, and news reports. Individual items are not identified in order to preserve the anonymity of the case.

In the first two attempts, approval preceded disclosure, and neither produced a recorded hearing. Both were abandoned without the question ever reaching a formal forum.

The third attempt signed its concession before disclosure, posted the planning notice after construction had begun, and convened a hearing only after the municipal enforcement bureau issued a stop-work order. Nineteen of twenty-five participants opposed. Approvals, assessments, and land procedures were all in place. The missing permit had no substitute, and its absence was enough to stop a plant three-tenths built.

The fourth attempt inverted the sequence. Sites were screened before any public commitment, approvals were displayed before ground was broken, and residents were taken to operating plants elsewhere before they were asked to accept one at home. Opposition was no weaker. Three of the four logics were in place before the first blockade. Its own hearing was held in May 2018, before the decision it informed, and the recommendations raised there reappear in the operating arrangements, from community supervisors to local hiring.

Read against the framework, the sequence supplies a test. Political direction was present in all four. The failures differed in the timing of procedure, the presence of relational work, and the verifiability of technical claims. Had any failed attempt combined all four and still collapsed, the framework would not hold.

3.4. Data Collection and Triangulation

To ensure empirical reliability and perform multi-source data triangulation, our research team conducted multiple rounds of fieldwork and in-depth interviews across the X County Government, the HK Town Government, adjacent village communities, and the WTE plant starting in 2022. Fieldwork primarily comprised on-site interviews from 2022 to 2023, supplemented by online interviews from 2024 onward to expand sample coverage and mitigate potential retrospective recall bias. Interviewees encompassed county-level coordinating officials, HK Town frontline implementation cadres, enterprise managers and technical engineers, and neighboring villagers—including early project participants and key village opinion leaders (see Table 2). Ten interviews with eight respondents form the core of the analysis, selected to cover the four roles above and including residents sanctioned after the 2018 protests.

Alongside interviews, the research team collected media reports and historical archives documenting Y City's previous facility siting attempts between 2008 and 2014, as well as public environmental impact assessment (EIA) reports, social stability risk assessment (SSRA) notices, government meeting minutes, land acquisition files, and online public opinion records for the HK Town project (see Table 3). These heterogeneous data sources were cross-referenced and triangulated to verify the chronological timeline of project implementation and associated governance practices. In accordance with academic ethics standards, all personal names and sensitive administrative titles have been anonymized.

Table 2. Interview List (2022–2025).

Interview ID	Interviewee	Location/Method	Key Interview Themes
CY20231105	Frontline execution cadre of HK Town	HK Town Government (On-site)	Mobilization via veteran Party member networks; practical problem-solving governance and public identification
CP20231105	County leader	X County Government (On-site)	Political resolve and firm site selection; lawful handling of illegal disruptions
ZQ20231105	Township cadre	HK Town Government (On-site)	Relational mobilization in acquaintance society; bridging role of village cadres
MZ20231106	Nearby villager	M Village, HK Town (On-site)	High-level joint county-town push; attitudinal shift from resistance to acceptance
MN20231106	Nearby villager	M Village, HK Town (On-site)	Perceptual change through field visits; livelihood benefits easing resistance; residual environmental concern
WBY20231106	Demolition and resettlement staff member	HK Town Government (On-site)	"Zero-petition" (ling shangfang) land acquisition experience; proper resettlement and social risk mitigation
FWY20241207	Deputy General Manager of GD Group	Online	Acceptance of real-time operational supervision; plant open days and public oversight mechanisms

Table 2. *Cont.*

Interview ID	Interviewee	Location/Method	Key Interview Themes
NY20250312	County-level project staff member	Online	Central state-owned enterprise (SOE) qualifications and standardized compliance; mitigating social pressure via high-quality developer selection
MN20251215	Nearby villager (Feedback provider)	Online	Rapid response to post-operational concerns; government responsiveness and long-term trust building
MZ20251215	Nearby villager (Feedback provider)	Online	Post-operational assessment of conflict mitigation; informal complaint expression; lingering worries over equipment and supervision

Note: Interview-ID coding rule—the prefix letters (2–3 characters, e.g., CY, CP, ZQ, WBY) denote the respondent's initials, and the following eight digits denote the interview date (YYYYMMDD).

Table 3. Archival and Secondary Data Sources.

Data Category & Source	Timeframe	Primary Contents	Analytical Purpose & Governance Logic
Media Archives & Online Public Opinion (Local news, online public forums)	2008–2025	Historical NIMBY disputes, public grievances, and official responses	Reconstructs longitudinal background; evaluates Emotional Logic (public sentiment evolution)
Statutory Assessment Documents (EIA reports and SSRA notices)	2018–2019	Site selection rationales, pollution forecasts, risk identification, and contingency plans	Verifies Administrative & Technical Logics (procedural legitimacy & risk mitigation)
Internal Administrative Records (Meeting minutes, land acquisition files)	2018–2021	Dual-leadership command structure, cross-dept decisions, and land compensation details	Traces Political & Administrative Logics (bureaucratic operations & procedural fairness)
Real-time Plant Emissions Data (GD Group smart power platform)	2021–2026	24/7 continuous emissions data (SO_2, NO□, dust, furnace temperature)	Triangulates Technical Logic (data transparency & verifiable trust)

Notably, because the facility entered commercial operation in 2021, interviews conducted from 2022 onward primarily represent a retrospective process-tracing of the governance practices during the mobilization and construction phase (2018–2021) alongside post-occupancy operational performance. Accounts provided by county-level coordinating officials and frontline HK Town cadres focused predominantly on their experiences surrounding mobilization, resident conflict resolution, and land acquisition/resettlement, distinguishing these historical events from routine administrative duties following commercial operation.

Analytical procedure. All interview recordings were transcribed verbatim and analyzed through iterative thematic coding, in which first-order codes were derived from close readings of the transcripts, grouped into categories aligned with the four governance logics, and continuously compared against archival materials. Coding proceeded iteratively: inter-

view accounts were cross-validated against statutory assessment documents, administrative records, media archives, and real-time emission data, and divergent accounts were resolved by prioritizing documentary evidence. Data collection and analysis advanced together; fieldwork and follow-up interviews were extended into 2024 and 2025 until new themes ceased to emerge, indicating that thematic saturation had been reached for the governance practices under examination. This triangulation design ensures that each analytic claim is anchored in at least two independent data sources (see Tables 2 and 3). What counts as acceptance is either an expressed position or a documented action recorded in the fieldwork notes; silence, or the mere absence of open opposition, does not count as consent to the project.

4. Case Analysis: The Unfolding of Multi-Logic Governance in Rural NIMBY Conflict Management

In Risk Society, Ulrich Beck noted that the exponential growth of productive forces and technology during modernization, while creating material prosperity, unleashes environmental and social risks on an unprecedented scale [44]. The siting and construction of NIMBY facilities represent, at its core, the concentration and manifestation of modernized risks within specific geographic spaces. The complex origins of rural NIMBY disputes and the asymmetric distribution of costs and benefits dictate that governance must function as a systematic project spanning political, administrative, social, and technical dimensions. The crux of this endeavor lies in reconstructing the bonds of trust among the state, the market, and rural society. In transitioning the X County project from escalated confrontation to stable execution, the local government refrained from relying on unilateral administrative mandates or coercive suppression. Instead, by synergistically activating political, administrative, emotional, and technical logics, it achieved a systematic resolution of rural NIMBY risks.

4.1. The Political Logic of Rural NIMBY Governance: Party-Building Guidance and Authority Shaping

The essence of politics lies in the authoritative allocation of values and public goods for a society [45]. The root cause of NIMBY disputes resides in the spatial asymmetry between negative external risks and socio-economic benefits associated with public infrastructure. Within the contemporary Chinese grassroots governance context, the Party's political authority—exercised through overall leadership and stakeholder coordination—and its foundational mandate to represent the fundamental interests of the public provide natural political legitimacy and organizational mobilization power to resolve internal contradictions and reshape risk-benefit distributions [7,38]. The experience of X County demonstrates that the political logic of NIMBY governance translates the Party's political and organizational strengths into effective risk-governance capabilities.

4.1.1. Strengthening Local Party Committees' Political Leadership and Strategic Coordination

Faced with social stability risks generated by NIMBY disputes, single functional departments or township-level governments often fall into predicaments marked by inadequate authority or departmental silo mentality. The X County Party Committee elevated the WTE incineration plant project into the county's "Project No. 1" for ecological civilization construction and green development. Establishing a resolute determination from a strategic political height, the committee set an unshakeable governance tone: maintaining a steadfast commitment to site selection while taking a firm, zero-tolerance stance against unlawful disruptions, thereby curbing bureaucratic buck-passing and wait-and-see attitudes. As one county leader reflected:

> "*The County Party Committee's stance was exceedingly firm: first, the site selection was unshakeable; second, the crackdowns on illegal disruptions were resolute and uncompromising. We pushed this project forward with strong political determination*." (Interview No. CP20231105)

Throughout implementation, the local Party committee exercised its mandate of leading overall work and coordinating all sides. Upward, it forged a high degree of political consensus with the Y Municipal Party Committee, securing municipal funds, land quota allocations, and human resource prioritization to alleviate project bottlenecks. Downward, the County Party Secretary personally tracked project progress, urging the HK Town Party Committee to fulfill its localized territorial responsibilities and ensuring that cadres arrived on-site immediately to address resident grievances such as waste transport dust and leachate leaks. During early project stages, the local Party committee unified scientific and democratic decision-making by bringing environmental protection departments and expert teams into field surveys across 26 candidate sites. After 23 rounds of expert panel reviews, public hearings, and risk assessments, initial social resistance was minimized. This cautious siting model—characterized by multi-site inspections and iterative deliberations—contained public opposition at manageable levels once the final site was disclosed. Moreover, expert evaluations and public hearings were not mere formalities; planning teams repeatedly adjusted buffer distances and logistics corridors based on villager feedback, closing the loop between "scientific decision-making" and "democratic participation" during the siting phase and eroding organizational mobilization space for subsequent resistance at its source.

Furthermore, the local Party committee prioritized managing relationships among residents, experts, enterprises, and media outlets. Throughout the project, county and township cadres maintained continuous community mass work to listen to resident grievances; project construction enterprises were selected based on technical capabilities aligned with project demands; and media publicity was orchestrated around construction milestones. Villagers felt this presence directly:

> "*The township and county governments were both driving this initiative, and the County Party Secretary was personally following up on the project. Many of us gradually came to understand and accept it*." (Interview No. MZ20231106)

These practices embedded the local Party committee's political leadership deep within concrete workflows, including site selection, mass communication, and project execution.

4.1.2. Activating Grassroots Party Organizations' Penetrative Power and Vanguard Mechanisms

Grassroots Party organizations represent the neural endings through which the Party takes root in rural society. X County implemented an extra-administrative, Party-building-led governance model. On the one hand, it reshaped grassroots combat effectiveness by reassigning village cadres who wavered in their political standing or performed duties ineffectively, promoting outstanding Party members with high political consciousness, strong operational capabilities, solid public support, and enthusiasm for ecological projects to village Party secretaries. Because the WTE plant involved two townships, over 500 county and township cadres were dispatched to the frontline, enforcing a bundled responsibility mechanism where County Party Standing Committee members were paired with villages and departmental bureau directors were paired with households. Cadres visited rural homes to understand grievances, targetedly resolving bottlenecks in sanitation, transportation, and employment. On the other hand, leveraging the vanguard role of Party members, authorities organized over 50 village and group Party cadres from the target site to inspect similar demonstration projects in other regions. This broke cognitive misconceptions, enabling

Party members to serve as policy advocates and trust brokers within local acquaintance networks to drive attitudinal shifts among residents. As one HK Town leader noted:

> "*There was a veteran Party member who held high prestige in the village and strongly supported government work. He put in immense effort doing mass work within the village, saving us a lot of trouble.*" (Interview No. CY20231105)

4.2. The Administrative Logic of Rural NIMBY Governance: Inter-Departmental Synergy and Procedural Justice

If the political logic addresses "who leads" and the source of legitimacy, the administrative logic focuses on achieving governance efficiency and democracy through scientific administrative management and procedural justice. New Public Administration emphasizes that public administration must not only pursue efficiency, but also uphold social equity and democratic responsiveness as core values [12]. In its governance practice, X County eliminated bureaucratic barriers to enhance administrative responsiveness while establishing a rule-of-law foundation through whole-process procedural transparency and democratic participation.

4.2.1. Inter-Departmental Synergy and High-Level Steering for Enhanced Governance Efficiency

Traditional fragmented bureaucratic systems are highly prone to bureaucratic failure when confronted with cross-sectoral NIMBY conflicts. X County established a dual-leader Project Command Headquarters co-headed by the County Party Secretary and the County Magistrate, achieving a high concentration of administrative resources and political authority. The county internet information office and the publicity department established a real-time response mechanism to provide authoritative, immediate answers regarding the authenticity of EIA reports, site selection rationality, and public welfare policies; the agriculture and rural affairs department rapidly funded the paving of village roads, responding to residents' transport and environmental needs; and public security organs maintained construction and traffic order in accordance with the law, handling illegal activities such as inciting gatherings and damaging facilities, thereby securing the legal basis for smooth implementation. In total, over 60 individuals received reprimands, administrative detentions, or criminal detentions. A representative case involved Villager Xia (a local working overseas), who, upon learning of project construction, repeatedly incited villager sentiment via WeChat groups and supplied material support for protests; Xia was eventually arrested according to the law for disturbing traffic order and sentenced to nine months of imprisonment. As one X County leader noted:

> "*Regardless of what doubts the residents had—whether it was misunderstanding cadre mass work, land acquisition and resettlement policies, environmental compliance, or potential groundwater contamination—various departments responded immediately and coordinated effectively.*" (Interview No. CP20231105)

4.2.2. Procedural Justice and Effective Participation for Governance Democratization

The eruption of NIMBY disputes frequently stems from the deprivation of the public's right to know under the traditional DAD model [4]. Through whole-process information disclosure and the construction of expression channels, X County achieved a transition from closed decision-making to open governance. As one county leader reflected:

> "*When the county broke ground on the project, all 28 statutory procedures were laid out on the table for doubting citizens, journalists, and experts to inspect. Information disclosure was fully in place.*" (Interview No. CP20231105)

The county government fully disclosed the 28 statutory approval procedures, EIA reports, and demolition compensation standards associated with the project, while providing accessible interpretations of technical jargon. Starting in 2018, authorities took residents to inspect operating WTE facilities elsewhere, dismantling stereotypical perceptions of black smoke and foul odors.

Regarding the safeguard of expression and oversight rights, land acquisition for the 117 mu (approx. 7.8 hectares) within the project boundary and the resettlement of six households were finalized with reasonable compensation schemes through multiple rounds of negotiation, achieving zero petitions related to land acquisition and demolition. As one demolition staff member noted:

> "*We are fortunate that, up to now, no one has petitioned due to land acquisition or demolition; doing land acquisition work diligently truly yields results*." (Interview No. WBY20231106)

Concurrently, authorities constructed online website Q&A portals alongside offline village cadre reception mechanisms to guarantee that resident feedback on issues like transport waste and construction noise was verified and handled within 24 h, enhancing state-citizen trust. One villager remarked:

> "*Since the plant went into operation, whenever issues like waste spillage from transport trucks came up, we reported them to village cadres and someone came to fix it almost immediately. They even followed up later to check if it reoccurred. Seeing that our feedback is still promptly addressed after construction is completed makes us neighbors feel truly reassured*." (Interview No. MN20251215)

4.3. The Emotional Logic of Rural NIMBY Governance: Acquaintance Networks and Benefit Sharing

Emotional attachment and place attachment have long been regarded by international scholars as universal psychological foundations for mitigating resistance to NIMBY facilities; when residents form an identity with their place of residence, facilities are more easily experienced as part of their "self-space" rather than an external intrusion [30]. However, the specific manifestation of this emotional mechanism varies across societies. In rural China, it is embedded in the acquaintance society described by Fei Xiaotong and the "differential mode of association" (chaxu geju) bonded by kinship and geographic ties [41]. In rural contexts where formal institutions and legal provisions are relatively weak and informal norms hold significant sway, relying solely on administrative mandates struggles to alleviate villagers' deep-seated psychological anxiety. Therefore, emotional governance, as a vital supplement to formal administration, constructs a psychological bridge for state-citizen communication by mobilizing informal relational resources within acquaintance societies—specifically, the informal accountability of solidary groups [39] and the social networks sustained by gift reciprocity [40]—reconstructing emotional ties and tying the project closely to overall village welfare. These informal mechanisms constitute the social foundation through which emotional governance operates in rural China.

4.3.1. Embedding Rural Acquaintance Networks and Reconstructing Emotional Relationships

Grassroots cadres fully activated rural relational capital to execute soft mobilization, mobilizing village cadres, local elites (xiangxian), and villagers' relatives/friends to form relational circle mobilization networks. These informal actors, well-acquainted with family backgrounds, understood genuine emotions and practical difficulties through informal chit-chat, assisting with ideological guidance. For external cadres lacking local relational capital,

they offset this resource deficit through frequent visits and pragmatic service delivery. The county government tied project implementation directly to village public welfare by upgrading infrastructure, installing streetlights, implementing greening projects, constructing cultural/sports squares, and regularly visiting vulnerable households, enabling villagers to directly perceive government goodwill and transforming "antagonistic sentiment" into "psychological identification." As one township cadre reflected:

> "*Having dealt with village cadres over the long term, everyone is quite familiar. Since the project is mainly implemented in the village, village cadres have many opportunities to speak up and can definitely play an impactful role*." (Interview No. ZQ20231105)

Building upon this, X County tied the project closely to village development. Surrounding villagers received priority local employment, and affected villages were incorporated into Beautiful Countryside initiatives, which improved public amenities such as roads, greening, and cultural and sports squares. The facility thus shifted from an external burden to a shared development engine. Specifically, the county government fulfilled a commitment of 500,000 RMB annually in infrastructure development funds for each of the nine villages within a 3 km radius of the plant, visited 50 low-income households each year (500 RMB per household), allocated a special fund of 9.32 million RMB for landless farmers' social security, provided monthly pensions ranging from 1050 to 1750 RMB for 60 individuals, installed 200 streetlights along village roads, and planted greening trees—turning the village-benefit commitment into delivered infrastructure.

During the operational phase, this village-benefiting logic further evolved into "factory-village symbiosis" (changcun gongsheng). GD Group adopted a local-first hiring policy, with local employees exceeding 60% and providing employment for 206 villagers from surrounding areas. Furthermore, waste heat recovered from incineration supplies process steam to nearby firms, and the company backs a water-supply project serving about 20,000 residents around the plant. Through these arrangements, the enterprise moved from a mere facility operator to a stakeholder in rural development.

4.3.2. Refining and Popularizing Emotional Communication Tools

Only by making governance methods more scientific and modernizing governance tools can negative public sentiment toward NIMBY projects be reduced.

First, cadre persuasive techniques were deployed efficiently. A village group leader in an X County village had previously mounted fierce opposition against the WTE plant project by pasting 5000 opposition slogans and displaying 120 black-and-white opposition banners. In response, grassroots cadres actively intervened, tirelessly visiting his home to perform persuasion work, rationally analyzing the situation, and ultimately securing the opponent's signature on the land acquisition agreement. Applying such persuasive techniques required, first, activating emotional relationship networks and leveraging "acquaintance" connections to perform ideological work; and second, awakening consciousness, inspiring collective identity among dissenting individuals, and cultivating public spirit. As one HK Town leader stated:

> "*Many cadres worked tirelessly day and night to conduct persuasive work with residents, and the overall process proceeded quite smoothly*." (Interview No. CY20231105)

Second, project-related knowledge needs to be disseminated transparently. Nevertheless, scientific-technical expertise should not be treated as the sole legitimate knowledge base for facility-siting governance; public opposition cannot be simply resolved through one-way popular-science education [21,22]. X County articulated its stance by issuing An Open Letter to the People of the Whole County, declaring that "we will earnestly listen to public

opinion, adhere to the mass line...the County Party Committee and County Government are firmly committed to standing heart-to-heart and marching in the same direction as the people," calling on residents not to believe or spread rumors, thereby consolidating social consensus. Concurrently, authorities distributed 47,600 copies of publicity materials (a set of four booklets) covering project operations, siting rationales, and demolition standards, popularizing relevant information to reshape public risk perception.

Finally, media tools were extensively utilized. Public queries, doubts, or misunderstandings regarding the project submitted through the mayor's hotline and local online forums received timely and accurate responses, placing strong emphasis on emotional counseling for citizens. Meanwhile, authorities amplified publicity through television, cable TV, periodic market fairs (ganji), and village loudspeakers ("village-to-village audio broadcasts"), establishing emotional connections and leveraging media to lower public perceptions of NIMBY risks. As one HK Town leader noted:

> "*The practical deeds we performed allowed ordinary people to realize that the government was truly serving the public, and demonstrated our confidence and determination to build this project; both individuals and units made immense contributions*." (Interview No. CY20231105)

Evidently, the emotional logic functions as a systematic trust-building project that demystifies through scientific knowledge, relieves impasses through relational networks, and consolidates foundations through public welfare. It translates an abstract state project into a tangible, participatory, and beneficial local affair for villagers.

4.4. The Technical Logic of Rural NIMBY Governance: High-Standard Construction and Data Transparency

The immediate trigger for NIMBY resistance lies in public anxieties over technological risks, such as dioxins, foul odors, and groundwater contamination. Mitigating NIMBY effects at source requires a foundation of technical safety and trust [19,21]. As the backstop of the multi-logic governance framework, the technical logic introduces high-standard pollution-control engineering and end-to-end data transparency, converting opaque technology into verifiable safety data that bridges objective ecological risk and subjective perception [20,22].

4.4.1. Introducing Top-Tier Enterprises and High-Standard Process Specifications

X County established the operating guidelines of "high-starting-point positioning, high-standard planning, high-quality construction, and high-level operation." Through open competitive bidding, it introduced GD Group, a central state-owned enterprise (SOE) that has undertaken over 170 similar projects nationwide (including 18 in H Province). The project strictly adheres to the same emission limit values of Directive 2010/75/EU, employs reverse-reciprocating mechanical grate incinerators, and operates in strict accordance with national industry standards such as the Construction Standard of Municipal Solid Waste Incineration Projects and the Technical Code for Municipal Solid Waste Incineration Projects. This ensures furnace temperatures consistently exceed 850 °C with flue gas retention time exceeding 2 s, efficiently decomposing dioxins through physical mechanisms. The facility is equipped with flue gas purification systems (selective non-catalytic reduction denitrification, activated carbon adsorption, and baghouse dust removal) and leachate treatment systems, achieving zero wastewater discharge and solid waste resource utilization, thereby honoring environmental commitments. As one county staff member noted:

> "*As a central enterprise, GD's management is extremely scientific and sound, fulfilling all commitments made during construction. Selecting the right construction entity*

is crucial; a good developer can eliminate a great deal of pressure." (Interview No. NY20250312)

4.4.2. Technological Innovation and All-Weather Data Transparency Mechanisms

To prevent high-tech facilities from becoming sources of unknowable risk, GD Group and the local government established mechanisms for technological transparency and public oversight, ensuring green operations through above-standard facility configurations, investment allocations, and standardized governance structures. The plant introduced license plate recognition, automatic combustion control and smart burning systems, and a smart power plant platform, achieving refined control across the entire receiving–incineration–power generation–emission pipeline. A giant electronic display screen was installed at the plant's main entrance to broadcast 24/7 real-time data on SO_2, NO□, particulate matter concentrations, and furnace temperatures, fully networked with provincial and municipal environmental monitoring servers. Regular plant open days were instituted, inviting villager representatives, students, and media into the central control room for on-site inspection, transforming abstract engineering terms into intuitive proof of trustworthiness and thoroughly dispelling suspicions of "nighttime illegal discharge" [4,5].

At the operational front, GD Group continuously optimized and upgraded auxiliary infrastructure—including waste receiving/feeding, wastewater treatment, and flue gas purification systems—achieving localized, harmless, and resource-oriented terminal processing. Crucially, the company hired local villagers as corporate environmental supervisors, granting them the right to perform independent inspections inside the plant and directly report to environmental protection authorities, thereby institutionalizing and normalizing public oversight. This corporate environmental supervisor system transformed villagers from passive pollution recipients into active compliance witnesses; their periodic inspections and direct reporting established a low-cost, normalized mutual trust channel between the facility and the community, significantly reducing the risk of a post-operational NIMBY resurgence. As a deputy general manager of GD Group stated:

"*We have strictly accepted government supervision and guidance throughout. The government monitors operations in real time, and we continuously welcome visits from local residents*." (Interview No. FWY20241207)

Within its first four years of operation, the plant logged over 1400 consecutive days of safe and stable performance without a single work-safety incident or environmental emission violation. The project has been designated a "National Open Unit for Environmental Protection and Urban Sewage/Waste Treatment Facilities," a provincial industrial tourism demonstration site, and a provincial ecological environment science education base, hosting more than 4800 visitor trips across various sectors. Its plant open days and corporate environmental supervisor system have established durable channels for making operations verifiable. What residents reported as reassuring, however, was the response to their complaints. Residents near the plant knew of the perimeter screen and the open days, and none described the readings themselves as the reason for a change in view. As one villager put it:

"We can see the emission display board at the gate anytime, but what really eases our worries is that our complaints do not just stay on paper." (Interview No. MZ20251215)

The technical logic therefore supplies verifiability and binding constraint; the trust observed in the case was generated elsewhere, through responsiveness to grievances and through perceptible local improvement.

5. Discussion: Synergistic Mechanisms and Theoretical Implications of the Fourfold Logic

The four sets of practice demonstrate that the transition of a rural WTE project from NIMBY opposition to PIMBY acceptance encompasses four distinct categories of practice: political, administrative, emotional, and technical. Existing scholarship predominantly explains NIMBY facility siting and conflict resolution through technological risk perception and management, economic compensation, or state coercion.

In rural NIMBY governance, these varied practices correspond to distinct actors and strategic tasks:

Local Party committees and primary-level Party organizations guide the overarching political direction and lead organizational mobilization;

County and township governments, along with functional departments, execute formal administrative procedures and oversee public affairs;

Township and village cadres, alongside local elites (xiangxian), leverage acquaintance networks to navigate villagers' emotional dynamics and conduct routine communication; and Local governments and enterprises address public anxieties regarding environmental pollution through rigorous technical infrastructure construction and transparent environmental information disclosure.

Together, these four sets of practices constitute the integrated governance configuration that facilitated project execution in X County (see Table 4). Building upon these empirical findings, this section further discusses how these four practices interact synergistically to resolve NIMBY disputes, as well as the theoretical implications this process holds for understanding relational bureaucracy and the NIMBY-to-PIMBY transformation.

Table 4. The Multi-Logic Architecture of Rural NIMBY Conflict Governance in China.

Logic Type	Core Acting Subjects	Theoretical Connotation and Functional Positioning
Political Logic	Local Party committees, grassroots Party organizations, and Party members and cadres	Fundamental leadership and legitimacy building. Exercising the Party's role of "taking overall charge and coordinating all sides," transforming Party-building strengths into governance efficacy, and blocking the diffusion of NIMBY risks.
Administrative Logic	Functional departments of county government and township governments	Procedural justice and efficiency assurance. Grounded in efficiency while introducing fairness and democratic values, safeguarding rigid legitimacy through institutionalized responsiveness and inter-departmental coordination.
Emotional Logic	Township cadres, village cadres, and rural local elites (xiangxian)	Relational lubrication and trust reconstruction. Mobilizing the informal relational resources of China's rural acquaintance society (shuren shehui), dissolving negative sentiment, and binding the project to village welfare.
Technical Logic	Local governments and the construction–operation enterprise (a central SOE)	Hard-core support and bottom-line safeguard. Eliminating objective ecological risks and public technological anxiety through high-standard pollution-control engineering and data-transparency mechanisms.

5.1. Beyond Single-Logic Reductionism: Synergistic Coupling Mechanisms of the Fourfold Logic

Existing literature often falls into reductionist traps: technocratic approaches assume that superior engineering alone can eliminate public fear, while compensation-centered approaches treat economic compensation as a panacea for offsetting negative externali-

ties [29]. However, isolated technical fixes or cash transfers rarely secure acceptance on their own [31], and where trust and procedural legitimacy are absent, they may even provoke backlash. The experience of X County indicates that public acceptance emerges from the synergistic coupling of political, administrative, emotional, and technical logics. Rather than acting as parallel, independent variables, these four logics form an interlocking, mutually compensatory matrix. Read jointly, the four logics recast acceptance from a level to be raised to a configuration to be assembled, and each enters as a condition the others cannot supply.

Within this matrix, the fourfold logic continuously generates governance efficacy through pairwise coupling:

Political–Administrative Coupling: "Legitimate and Responsive Authority." The political logic provides overarching authority and cross-departmental mobilization capacity sufficient to overcome bureaucratic inertia. Concurrently, the administrative logic anchors political resolve within standardized, legal-rational procedures, preventing political mobilization from degenerating into arbitrary coercion.

Political–Emotional Coupling: "Relational Mobilization." Top-down Party directives are translated through informal, grassroots social networks (such as Party member household-pairing). Cadres leverage personal reputations and kinship ties to listen to grievances, transforming rigid state authority into empathetic household dialogues. This relational mobilization is deeply embedded in the solidary groups and gift-reciprocity networks of rural China.

Administrative–Technical Coupling: "Verifiable Procedural Openness." Administrative commitments to transparency are validated by continuous, automated technical disclosures—such as 24/7 LED screens networked with provincial environmental departments. Technology thus translates abstract administrative promises into verifiable empirical data.

Emotional–Technical Coupling: "Empathetic Risk Communication." State-of-the-art hardware, including flue gas purification that meets Directive 2010/75/EU limits, is demystified through human-centered participation mechanisms, such as monthly open days and villager environmental supervisors, converting technical data into relational trust.

This multi-logic synergy demonstrates that trust is inherently multidimensional. De-escalating NIMBY resistance requires aligning institutional trust (via administrative responsiveness), relational trust (via emotional connections), and technical trust (via verifiable disclosure) anchored by political legitimacy. Viewed through this lens, any single logic possesses inherent limitations: political logic without procedural anchoring risks becoming coercive; administrative logic without emotional lubrication becomes alienated; emotional logic without technical backing remains empty; and technical logic without political empowerment lacks authority. The mutual irreplaceability of the four logics is the principal source of governance resilience. From a comparative perspective, this synergistic matrix holds strong explanatory power for strong state–weak society transitional economies. When formal institutional trust is tenuous, political mobilization provides a directional anchor, emotional governance complements relational trust, and technical transparency offers verifiable credentials. These three forms of trust step into each other's gaps, preventing a failure in a single dimension from escalating into systemic collapse. This also suggests that effective rural NIMBY governance does not necessarily presuppose a mature civil society; rather, it can be generated through the creative synthesis of state capacity and social embeddedness.

5.2. Rethinking Authoritarian Environmentalism: Relational Bureaucracy and Flexible State Capacity

The dominant paradigm in international literature characterizes Chinese environmental governance as authoritarian environmentalism—a top-down system relying on administrative mandates, campaign-style mobilization, and the suppression of civic dis-

sent to achieve policy goals [7,38]. While this paradigm captures state capacity in policy implementation, it underestimates the local flexibility, social responsiveness, and informal negotiation embedded in grassroots governance. The trajectory of X County challenges the crude binary opposition between state coercion and "democratic participation." Facing initial resistance in 2018, the county government did not clear the site through a single police operation. It activated a "relational bureaucracy" that combined hard state capacity with soft relational governance, in which persuasion carried the main body of the work and legal coercion operated at its margins. As local officials noted:

> "*Eighty percent of the effort went into persuasion, with enforcement following only where evidence of unlawful conduct was conclusive*." (Interview No. CP20231105)

Sanctions were individualized rather than collective, comprising admonition, public-security detention, and criminal detention, and totaling over 60 persons, which officials present as the lowest count among comparable projects. Coercion was therefore present throughout the process, bounded in scope, attached to identifiable unlawful acts, and subordinated to a predominantly relational repertoire.

On the one hand, the local government abandoned the rigid DAD framework, exercising administrative flexibility to expand safety buffer distances, re-route heavy logistics away from villages, and couple project execution with rural revitalization. On the other hand, in rural spaces, the boundary between state and society is highly permeable. Grassroots cadres serve simultaneously as representatives of state authority and embedded members of village kinship networks. Through "bedside dialogues" (kangtou duihua), they deploy soft state capacity, negotiating terms through empathy, reciprocity, and local social capital rather than unilateral administrative orders. Consequently, state authority serves as an empowering framework that secures cross-institutional resources, guarantees long-term fiscal commitments to community development, and enforces environmental supervision, rather than acting as a blunt instrument of suppression.

This relational bureaucracy revises rather than rejects the authoritarian environmentalism paradigm at the rural micro-level. It retains the integrative advantages of state capacity while instilling the flexibility of relational governance, ensuring project legitimacy stems not only from higher-level authorization but also from daily mutual trust established with villagers.

Four conditions push relational bureaucracy toward coercion: organized blockades that halt construction, converting persuasion into a public order problem; a completion deadline set by higher-level performance assessment, which shortens the time for household work; the absence of a distributable benefit package, leaving persuasion without material content; and a thin relational network, as in communities of recent migrants or resettlement beyond village ties. X County sat at the favorable end of the third and fourth, which is why enforcement stayed at the margin. Where the first two are present and the latter two absent, the same repertoire would produce compliance without acceptance, and the framework describes a configuration that can fail in that direction.

Coercion and acceptance here are layered. The two operate at the same time and on different populations. Coercion settled the residents who organized blockades and banners; it did not generate acceptance among the wider population, and no fieldwork account claims otherwise. It removed organized confrontation as an option, letting household persuasion, site visits, and benefit delivery proceed, and consent grew in the space enforcement cleared, though it depends on that space holding. The authoritarian environmentalism paradigm is right about the presence of coercion and wrong about its location. In X County, enforcement fell on unlawful conduct at specific points, while resettlement proceeded by negotiation. Coercion accounts for the disappearance of protest better than for the emergence of acceptance; the two should not be read as evidence of each other.

5.3. Exploring NIMBY-to-PIMBY Transformation in Rural Contexts

Urban NIMBY movements are characterized by legal rights advocacy and formal civil society organizations [33,34]. Contemporary NIMBY contention additionally draws heavily on digital and social-media repertoires for mobilization [46]. In contrast, rural NIMBY conflicts exhibit distinct spatial and socio-cultural dynamics. Rural communities often display a higher baseline openness toward facilities that deliver tangible regional development dividends, yet they remain highly sensitive to urban–rural inequalities and procedural disrespect [22]. Although this urban–rural divergence in acceptance echoes international findings, the uniqueness of rural China lies in the fact that emotional ties are deeply embedded in an acquaintance society and the differential mode of association. This makes relational trust the critical mediator in achieving acceptance transformation, while formal legal and procedural channels carry less weight. The case of X County offers an integrative process model explaining how rural communities transition along the resistance–acceptance spectrum (see Table 5).

This process shows PIMBY to be a local configuration in which the facility has been absorbed into the institutional and emotional life of the host community. Two qualifications are required. PIMBY in X County denotes conditional acceptance rather than endorsement. A villager who once opposed the project described his position in terms that withhold assent:

> "*I can accept the improvement in our living conditions, but I cannot endorse this project unconditionally*" (Interview No. MN20231106).

Acceptance is also uneven across distance and exposure. Villagers beyond the immediate footprint, who hold no resettlement claim, describe a stance of neutrality that stops well short of support, while households closest to the plant continue to voice risk concerns in private even as they withdraw from public contention. When host villages are incorporated into Beautiful Countryside initiatives, granted priority local employment, and vested with real-time environmental oversight, the waste-to-energy plant is no longer perceived as an "exogenous hazard imposed by urban interests." Instead, it is reconstructed as a shared engine for collective rural modernization. This alignment between local development demands and national environmental objectives constitutes the core mechanism driving the rural transition from NIMBY to PIMBY. A recent scale-development study treats acceptance as a resilient state that fluctuates with operational performance, which matches the conditional character of assent reported here [47].

The contribution of this rural transformation model to global environmental governance theory lies in demonstrating that PIMBY acceptance can likewise be achieved within governance structures characterized by the juxtaposition of state capacity and social embeddedness, a configuration that extends the concept beyond the Western liberal democracies where it has mainly been documented. For other transitional economies and developing nations facing controversies over rural facility siting, the experience of X County suggests that coupling formal administrative authority with local relational networks and technological transparency may resolve deep-seated NIMBY resistance more effectively than simply replicating Western-style public participation procedures.

Moving from case study to industry-wide corroboration, X County is by no means an isolated instance. Scenario-based work on an incineration project in Hangzhou reports a comparable movement from strong resistance to a neighbor–benefit relationship across the project cycle [48]. Since 2022, China's waste incineration industry as a whole has exhibited a macro-level shift from "NIMBY" to "PIMBY/benefit-sharing" paradigms, replacing the former image of closed, shunned facilities with garden-style plants, normalized public open days, and benefit-sharing mechanisms. The "wall-less operation" concept advocated by

leading enterprises was notably highlighted as a model practice in the Ministry of Ecology and Environment's Progress Report on Zero-Waste City Construction (2023).

Table 5. An Integrative Process Model of the "Resistance–Acceptance" Trajectory in the X County Waste-to-Energy Incineration Project.

Stage and Timeline	Governance Mechanisms (Drivers)	Community Responses and Outcomes	Trajectory
Stage 1—NIMBY Resistance (2017–2018; decision July 2017, blockades from autumn 2018)	Site recommendation fixed before public consultation (26 candidate sites, 23 expert panels, expert review completed in April 2018); technological opacity (no disclosure of emission data or verification arrangements); perceived distributive inequality	Rising environmental anxiety; escalating rumor propagation; night-time road blockades by small groups, banners and leaflets; no mass gatherings and no petitioning	Far left: Strong resistance (NIMBY)
Stage 2—Governance Adjustment (2018–2021; hearing May 2018, EIA disclosure April 2019)	Political escalation (overarching coordination by the county Party committee; cross-departmental mobilization); procedural restructuring (siting hearing in May 2018, held before the decision, with its 16 recommendations carried into the operating arrangements; independent EIA review, with online monitoring disclosure as a condition of approval; SSRA review); empathetic intervention (downward deployment of cadres; Party-member household pairing)	Conflict de-escalation; rebuilding of cadre–citizen communication channels; gradual easing of public sentiment	Left → Middle: Resistance waning, dialogue initiated
Stage 3—Collaborative Consolidation (2021–2023; first waste August 2021)	Transparent monitoring (24/7 LED emissions screens networked with provincial environmental authorities); coupling with "Beautiful Countryside" initiatives; local hiring and pro-resident benefit sharing	Shared community benefits; residents who had joined the blockades took part in plant visits and followed the flue gas train; trust formed through site visits more than through published readings	Middle → Right: Shift from suspicion to acceptance
Stage 4—PIMBY Acceptance (2023–present)	Institutionalized supervision (community environmental supervisors, monthly open days); sustained delivery of symbiotic benefits; normalization of continuous dialogue mechanisms	More than 4800 visitor trips after commissioning; no petitioning over land acquisition or resettlement; acceptance voiced in interviews, with reservations kept private	Far right: Proactive embrace (PIMBY)

This industry-wide transition demonstrates that the multi-logic framework detailed in this study—comprising political direction, administrative transparency, emotional embeddedness, and a technical safety net—represents a systemic evolution synchronized with enhanced national governance capacity, stricter environmental standards, and an awakening public environmental rights consciousness. Consequently, the experience of X County offers both deep empirical insight and a replicable pathway for developing nations seeking to mitigate rural environmental inequality.

5.4. Sustainability Outcomes and SDG Alignment

Beyond its theoretical implications, the X County trajectory demonstrates measurable sustainability outcomes across the facility lifecycle, itemized in Table 6. Taken together, the outcomes indicate that the fourfold logic analyzed in this paper converted a resisted facility into an asset whose performance is open to external verification.

Table 6. Sustainability outcomes of the X County WTE project and their alignment with the SDGs.

Dimension	Indicator	Outcome	SDG Alignment
Environmental performance	Flue gas treatment standard; operational record	Purification compliant with Directive 2010/75/EU; over 1400 consecutive days of safe operation without work-safety incidents or emission violations; 24/7 public real-time emission disclosure networked with provincial authorities	SDG 11; SDG 12
Procedural governance	Information disclosure and siting rigor	28 statutory approval procedures, EIA reports, and compensation standards publicly disclosed; 26 candidate sites screened through 23 rounds of expert evaluation; third-party SSRA review and independent EIA reports	SDG 16
Socio-economic sharing	Employment and community benefits	206 local jobs (over 60% of the workforce); waste-heat water supply for about 20,000 residents; annual infrastructure funds of 500,000 RMB for each of the nine villages; landless-farmer social security	SDG 8; SDG 11

Emission performance does not rest on the operator's platform alone. The EIA approval issued by the provincial environmental authority in April 2019 sets binding total emission allowances, which fix the ceiling against which reported performance can be read. The continuous monitoring system is linked to that authority, which requires the readings to be displayed at the plant perimeter. Supervisory readings taken by the environmental protection bureau enter the same record. Municipal portals and local media have published annual throughput, generation, and nitrogen oxide figures independently of the company's own reporting. This analysis thus draws on publicly accessible, process-validated monitoring information and does not include independent reanalysis of raw data.

The four logics bear on different classes of sustainability outcomes, and the mapping carries analytical weight. Political logic sustains the institutional continuity that keeps commitments alive across administrative turnover. Administrative logic supplies procedural accountability, reaching the same class of outcome by a different route. Emotional logic generates the acceptance, enabling the delivery of socio-economic benefits. Technical logic determines environmental performance. The alignment claimed here is therefore conditional. A project that secures environmental performance while leaving benefit distribution skewed would satisfy the technical criterion and fail the SDG 11 criterion, and the framework predicts that such a project would not sustain acceptance. The assessment covers environmental performance, procedural accountability, and benefit distribution. Long-run social trust, ecological effects such as biodiversity and life-cycle emissions, and distributional equity within the county were not measured, as each would require longitudinal or household-level data that a single retrospective case cannot supply.

6. Conclusions, Policy Implications, and Research Limitations

6.1. Conclusions

NIMBY facilities—particularly WTE incineration plants—represent a universal challenge in global public governance. Based on a longitudinal case study of a WTE plant project in X County, China, this paper explores the mechanisms through which state-led governance transforms rural NIMBY resistance into sustained PIMBY acceptance, constructing an integrated multi-logic governance framework.

The findings demonstrate that the de-escalation of environmental conflicts and the cultivation of social acceptance rely on the synergistic operation of political, administrative, emotional, and technical logics:

Political logic elevates the project from a localized sanitation task into a macro eco-civilization mission, mobilizing primary-level networks to establish overarching political legitimacy.

Administrative logic replaces the closed DAD model with third-party SSRA review, transparent EIA disclosure, responsive siting adjustments, and efficient compensation mechanisms.

Emotional logic transforms perceived deprivation into shared development through empathetic dialogue and community-wide benefits.

Technical logic converts technological opacity into verifiable trust via high-standard pollution-control engineering and real-time data transparency.

By bridging hard state capacity with soft relational governance, the synergy among these four logics yields acceptance as a composite condition that has to be continuously reproduced. It holds only while the facility is institutionally integrated, technically verified, socio-economically embedded, and carried by affective ties within the host community at one and the same time. An absence of protest indicates none of these four. The acceptance documented here is nevertheless conditional, in that residents who benefit most directly continue to withhold full endorsement and to voice residual risk concerns in private. Its production also relied on a repertoire weighted toward persuasion, in which legal coercion figured only at the margins and against identifiable unlawful acts.

Taken together, the case shows that the four logics were introduced in succession, and that acceptance was assembled along that succession. The succession concerns the order in which each logic entered the process; once all four were present, each remained necessary to acceptance. This extends the framework from the decision to proceed to the accumulation of acceptance.

6.2. Policy Implications

The experience of X County offers five actionable pathways for planners, environmental policymakers, and public administration practitioners in global developing nations—particularly transitional economies facing controversies over rural facility siting:

1. Transition from Closed DAD to Open Procedural Governance. Abandon closed technocratic decision-making. The stability risk and environmental impact assessments should be commissioned from bodies independent of the implementing agency and completed before any candidate site is announced; early participation and transparent hearings can then prevent costly implementation delays and social unrest downstream.
2. Align Facility Siting with Community Development. Avoid relying solely on direct cash transfers, which are easily perceived as bribes. Instead, couple facility development with regional development strategies, endowing host communities with priority local employment, symbiotic energy dividends, and targeted infrastructure modernization, thereby aligning facility operations with long-term collective prosperity.
3. Institutionalize Technological Transparency. Operating enterprises must render technical data accessible and verifiable for non-expert citizens. Installing 24/7 electronic emission screens at plant gates, establishing real-time data links with environmental monitoring authorities, normalizing public open days, and appointing community environmental supervisors can successfully convert industrial operations into transparent and accountable public utilities. Enterprises should couple disclosure with formal grievance channels, with government oversight to ensure complaints receive feedback within published timeframes.

4. Mobilize Relational Bureaucracy and Empathetic Dialogue. In acquaintance-based rural societies, formal legal communication must be complemented by empathetic relational interactions. Through door-to-door visits and active listening, cadres can address individual anxieties, assist with non-project grievances, and cultivate mutual trust, turning relational accountability into an indispensable bridge between formal state authority and rural civil society.
5. Guard Against the Replication Trap of Coercion. The success of the fourfold logic relies on a synergistic equilibrium among political, administrative, emotional, and technical dimensions; over-reliance on any single dimension risks disrupting the trust loop. When transplanting this framework, planners must avoid degrading relational bureaucracy into campaign-style coercion, ensuring that flexible governance and procedural justice remain continuously present.

Taken together, these pathways indicate that sustainable facility siting in transitional economies rests on treating public participation, information disclosure, and community benefit-sharing as constitutive elements of waste infrastructure governance. Implementing them advances the targets of SDG 11 on inclusive settlement planning and SDG 12 on the environmentally sound management of waste, while SDG 16 supplies the institutional foundation of transparency and accountability on which the other two depend.

6.3. Research Limitations and Future Prospects

This study is subject to several limitations that warrant further exploration:

External Validity of the Single-Case Methodology: As a qualitative study focused on a single facility in central China, the findings are constrained by regional socio-political contexts. Future research should employ multi-case comparative designs across eastern, central, and western regions, as well as across distinct institutional systems, to test the framework's generalizability. Partial applicability requires four scope conditions. A context must have a higher-level authority able to mandate the facility and to commit resources on its behalf; a local administration empowered to design benefit packages of its own; a dense network of village-level social relations through which persuasion can operate; and a regulatory apparatus capable of publishing and enforcing emission performance. Where any of these is absent, the relative weight of the four logics shifts, and the sequence reported here should not be expected to recur in the same form. The conditions are stated as a test that can fail. A setting that satisfies all four should display a recognizably similar trajectory, while one that fails two or more should not.

Scaling the number of cases would not leave the relative weight of the four logics constant. Political logic dominates where a provincial or national program designates the site and assigns completion targets; technical logic gains weight where monitoring is dense and disclosure is independently verified; emotional logic matters most where host communities are socially dense and face-to-face persuasion remains feasible; administrative logic matters most where procedural decisions are subject to third-party review or litigation. A larger sample would therefore turn the balance into a variable to be estimated in each setting. What the framework claims is that all four logics are jointly necessary for durable acceptance.

Facility Type Specificity: WTE plants possess a unique risk spectrum and local economic dividends. Future studies could expand the framework to comparative infrastructure research involving nuclear facilities or chemical industrial parks to examine variations in the relative weights of the four logics.

Methodological Scope: This study relies primarily on qualitative interviews, observational data, and document analysis, which precludes the quantitative measurement of each logic's statistical contribution to individual acceptance levels. Future inquiries could

adopt mixed-methods approaches, combining large-sample household surveys and choice experiments to quantitatively map public acceptance thresholds and trade-offs.

In summary, the fourfold logic of rural NIMBY conflict governance in China operates in an interconnected and mutually reinforcing manner, exerting interactive force across different stages of the facility lifecycle to facilitate the smooth implementation of livelihood-oriented NIMBY projects while serving broader social development needs.

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Informed Consent Statement: Verbal informed consent was obtained from the participants. Verbal consent was obtained rather than written because the study involved anonymized interviews with adult public officials, enterprise staff, and villagers on public governance matters, and written signatures could compromise participant anonymity or were not practical in the interview setting.

Data Availability Statement: The interview transcripts and archival data supporting the findings contain potentially identifying administrative information and are available from the corresponding author upon reasonable request, subject to anonymity and ethics restrictions.

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