ingegneria sismica
International Journal of Earthquake Engineering
Anno XLIII - Num. 1 - 2026

Analysis of the Configuration of the Grassroots Social Collaborative Governance Model

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ABSTRACT: *The actual operation of grassroots social governance is rarely driven by a single factor; rather, it is more often the result of the interplay among governance objectives, participation structures, organizational coordination, technical conditions, and government attention.Centering on this issue, this paper transforms the "co-governance structure based on self-governance" into a testable configurational framework. With 25 basic level social management cases from Southwestern China as the sample, this article utilizes a fuzzy set qualitative comparative analysis method to recognize the forming routes of high-level and non-high-level basic level cooperative governance. This research takes government attention degree, kinds of participating bodies, organization coordination, information technology level, and quantity of objectives as antecedent conditions, hence takes governance performance as the outcome variable. The results indicate that no single necessary condition for high-level governance exhibits a consistency exceeding 0.90, whereas low-participation actor types constitute a necessary background condition for non-high-level governance, with a consistency of 0.926667. The analysis of sufficient conditions identifies five high-level solutions, which can be grouped into three pathways: authority-driven, autonomy-driven, and technology-driven;The overall solution for high-level governance has a consistency of 0.976462 and a coverage of 0.855625. Further comparison reveals that the authority-driven path exhibits the highest discriminative power, the autonomy-driven path demonstrates the strongest internal stability, and the technology-driven path covers the largest number of cases; however, there is significant overlap among these paths. The contributions of this paper are placed in: bringing self-governance and collaborative governance into a unified configuration frame; giving a design which can verify the sample coding and calibration; and to carry out identification and presentation of the causal asymmetry in grassroots cooperative governance by means of a comparison between high-level and non-high-level governance.*

KEYWORDS: *grassroots social governance; collaborative governance; configurational analysis; fsQCA; Southwest China*

1 Introduction

The challenges of grassroots social governance typically lie not in any single matter itself, but in the coordination burden generated when multiple governance objectives are simultaneously imposed on the same grassroots unit. Community conflict solving, public service supplying,

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https://doi.org/10.65102/is2026329
Published: 30 April, 2026

help for weak groups, risk early warning and reaction, grid-based task flowing, and cross-department coordination often take place at the same time in the identical space environment. For street, community, and rural governance units, governance performance depends not only on the input of resources and authority from higher levels but also on the foundation of local self-governance, the structure of participating actors, organizational coordination capabilities, and whether information technology tools can form a stable coordination mechanism. Research on collaborative governance has long pointed out that when diverse actors engage in sustained interaction around public issues, institutional design, trust formation, participation boundaries, and coordination procedures collectively influence the final outcome, while governance effectiveness is rarely determined linearly by a single variable [1, 2]. Subsequent research on collaborative innovation in public services and the performance of network governance has further demonstrated that participants' modes of engagement, cross-organizational collaborative relationships, and the quality of network management can alter information flow, resource integration, and implementation outcomes during the collaborative process [3-5].

This conclusion has special meaning when it is put into the situation of grass-roots society management. Basic level governance deals with high-occurrence, low-importance, broken-up but connected real problems; Numerous problems demand both fast solving and long-lasting discussion, and they include not only the opportune involvement of administrative departments but also the common joining of residents, social organizations, and platform systems. Along with digital platforms, data cooperation, and network service interfaces are step-by-step inserted into basic level governance procedures, information technology is not any longer only a support tool but has started to affect the organization mechanisms of problem finding, work assignment, feedback circles, and cross-border coordination [6, 7]. Especially in the research area of digital government, resources at platform boundaries, institutional logic, and the designing of cooperative digital projects have been proven to greatly change participation relations and collaboration costs. This shows that technological conditions have to be discussed together with institutional conditions in order to explain differences in governance performance. Furthermore, the recent discussions regarding data collaboration point out that, the success or failure of cooperative governance in digital spaces has close connection with data-sharing regulations, scopes of responsibility, and structures of mutual belief among organizations; only paying attention to the number of technology applications is many times not enough to explain the results of cooperation [8].

Although current studies have offered many useful analysis methods, three deficiencies still exist. First, a great many studies about basic level governance still depend on a net-effect framework, tending to focus on whether a single factor is "important" rather than examining how multiple conditions interact to influence governance performance.In the context of grassroots collaborative governance, there are often relationships of substitution, complementarity, and conditional dependence among government attention, participating actors, organizational coordination, technological support, and goal complexity; relying solely on single-factor comparisons makes it difficult to uncover the true mechanisms. Second, self-governance and collaborative governance are frequently discussed separately. Self-governance research emphasizes endogenous community order and resident self-organization, while collaborative governance research focuses more on cross-actor institutional arrangements and interaction procedures; however, the two are not mutually exclusive in grassroots settings.In grassroots governance practice, many high-performance cases rely not only on administrative impetus but also on the coupling of endogenous self-governance capabilities with low-cost communication tools. This "co-governance structure grounded in self-governance" needs to be discussed within a unified analytical framework [9]. Third, while typological studies on social governance innovation in China have begun to emerge, existing evidence is largely

concentrated on policy provision or general governance innovation performance. Regarding regions such as Southwest China-with features of complicated geographic situations, obvious differences between cities and villages, and unbalanced coexistence of folk conventions and digital abilities-there still has the absence of specialized type recognition that pays attention to the grassroots cooperative governance patterns themselves [10].

From a methodological perspective, this research gap also corresponds to a distinct identification challenge. There is no single pathway to grassroots social collaborative governance. In some scenarios, strong government attention and administrative integration can drive governance outcomes; in others, endogenous self-governance capabilities, institutionalized collaboration, and information technology support are the keys to stable operation; and in still others, outcomes are driven by a combination of highly complex objectives, multi-stakeholder participation, and platform coordination capabilities. Consequently, this paper is better suited to adopt a set-theoretic perspective to address concurrent causality, equivalent multiple pathways, and causal asymmetry. QCA and its extended research have long emphasized that outcomes in complex social phenomena are often not the simple sum of individual conditions, but rather the product of different combinations of conditions [11-13]. This methodological logic aligns closely with the complexity of the objects of grassroots collaborative governance and can also prevent high-performance and low-performance pathways from being erroneously treated as mirror images of one another.

Against this backdrop, this paper narrows the research questions to three levels: first, which combinations of conditions are sufficient to produce high-level grassroots social collaborative governance; second, which combinations of conditions lead to suboptimal governance; and third, how the three governance logics-authority, autonomy, and technology-can be explained within a single configurational framework.Centering on these three questions, this paper draws on 25 officially reported cases from Southwest China to construct a conditional structure comprising "government attention-types of participating actors-organizational coordination-level of information technology-number of objectives," and conducts a configuration analysis using governance performance as the outcome set. The paper's contributions are threefold: first, it integrates the logic of autonomy with that of collaborative governance into a single observable conditional framework, thereby enhancing the structural explanatory power of grassroots governance research;second, using fsQCA to identify high-level and non-high-level governance pathways, thereby revealing causal asymmetry in grassroots collaborative governance; and third, elevating digital technology from a general contextual factor to a governance condition comparable to authority and autonomy, thereby providing a more operational analytical entry point for explaining variations in grassroots governance in Southwest China [14-16].

2 Methods

2.1 Research Design and Analytical Framework

This research uses fsQCA to be the core analysis tool. This method is fitting for handling concurrent cause-effect relations, equal multiple paths, and result non-symmetry in researches having small to medium-scale samples, and is also efficacious for building testable links between theoretical frames and case materials. The present paper directly projects the three questions in the introduction onto three methodological procedures: Firstly, the "co-governance structure which is based on autonomy" is compressed into five observable conditions; Second, the source obtaining of samples, coding regulations, and fuzzy set calibration procedure are arranged into a design that can be repeated; Third, both high-level and not high-level governance roads are found at the same time, and hence robustness tests are utilized to evaluate

the stability of the outcomes. This method builds a one-to-one matching relation between the methodology part and the opening part, hence permitting later results to be directly connected with the above-mentioned design.

In terms of theoretical integration, this paper retains only those elements directly relevant to variable identification. "Synergetics" is employed to illustrate that grassroots governance is not a static structure subject to external control, but rather an open system jointly shaped by endogenous autonomous order and external support; "collaborative governance" is used to explain how this open system enters an observable state through institutional arrangements, participatory structures, and coordination mechanisms.Based on this integration, this paper sets government attention, types of participating actors, organizational coordination, information technology levels, and the number of objectives as antecedent conditions, and defines the performance of grassroots collaborative governance as the outcome variable. In the results section, this performance is further explained according to three pathways: authority-driven, autonomy-driven, and technology-driven. This analytical framework addresses both the issue of integrating institutions and processes in collaborative governance research and the question of why technological conditions must be discussed alongside institutional conditions in digital collaboration research.The analytical logic of this paper is illustrated in Figure 1.

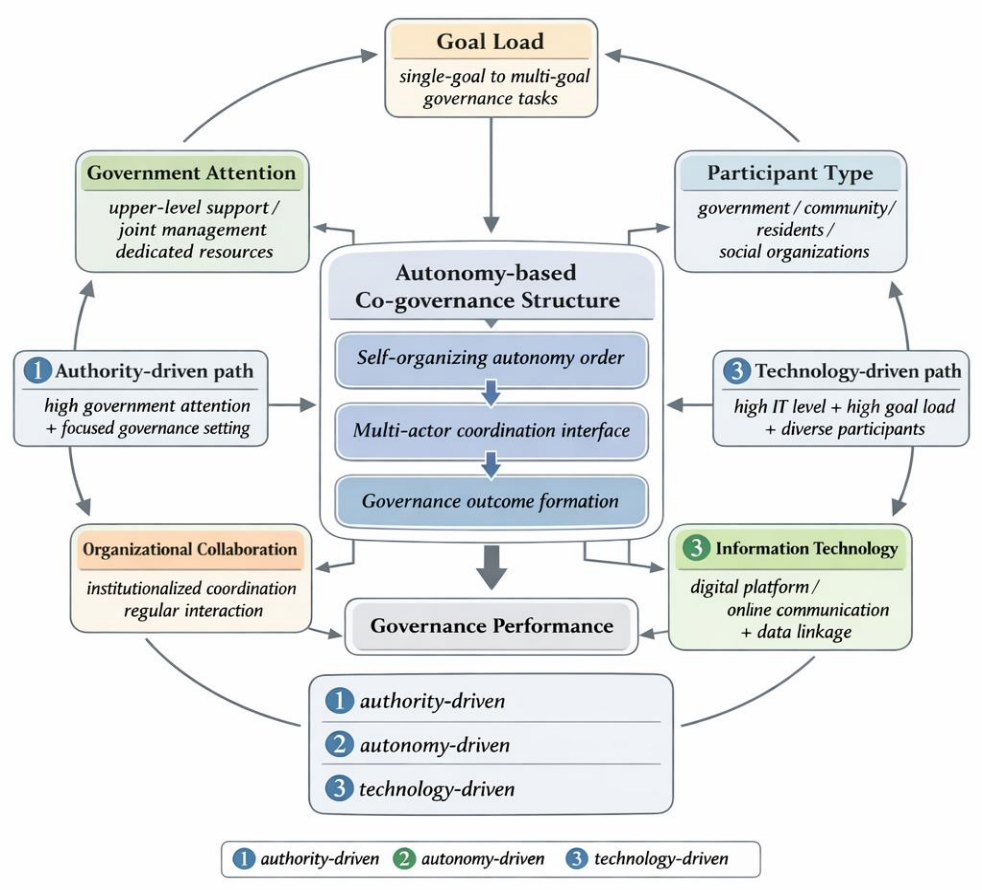

Figure 1: Diagram of the Theoretical Logic and Configuration Identification Framework.

2.2 Case Selection, Coding Protocol, and Calibration

To ensure that the sample exhibits regional, governance context, and performance diversity, Table 1 summarizes the regional origins, governance domains, administrative levels, and implementation contexts of the 25 cases included in this study.

Table 1: Case Sources and Inclusion Criteria

Item	Content
Total cases	25
Regional coverage	Yunnan, Guizhou, Sichuan, Xizang, Chongqing
Source types	National government portals; provincial government portals; officially recognized governance innovation lists
Time window of source collection	2023-2024
Inclusion criterion 1	The case must belong to grassroots social governance rather than general administrative reform
Inclusion criterion 2	The case report must contain enough information on actors, institutional arrangements, tools, goals, and outcomes for calibration
Inclusion criterion 3	The case must have been implemented for at least one year
Bias-control design	Four officially reported but non-award-winning cases were retained
Governance arenas covered	Rural governance; community governance; public service delivery; conflict mediation; digital governance
Spatial setting	Both rural and urban settings

Note: Auxiliary indicators for the outcome variable include institutionalization, horizontal or vertical diffusion, public satisfaction, and external recognition.

In Table 1, this research utilizes a purpose-driven small-sample scheme, with the sample mainly taken from nation and province government website pages, catalogues of governance innovation cases, and correlative publicly open official documents from 2023-2024. The inclusion of cases followed three standards: first, each case must clearly belong to basic level social governance, and not be ordinary administrative reform; Second, the materials must have inside them key message such as the management subject, organization arrangements, technique instruments, aims, and effect results; Third, the execution time period must be not shorter than one year, hence to avoid taking short-term starting effects by mistake for governance results. For the purpose of alleviating the prejudice caused by "only picking successful examples", the sample also has four cases which got official reportage but have not obtained prizes. The ultimate sample includes Yunnan, Guizhou, Sichuan, Tibet, and Chongqing, it holds both city and country situations and also various government work items.

Table 2 presents the fuzzy set assignments for the five antecedent conditions and outcome variables, serving as the input matrix for subsequent analyses of necessary and sufficient conditions. This study employs four-valued fuzzy set theory, assigning membership degrees of 0, 0.33, 0.67, and 1. The coding process was completed in the following sequence: "two researchers coded independently-differences were reconciled on a case-by-case basis-experts reviewed disputed items-and a final consensus was reached."Government attention is assigned values based on support from higher authorities, cross-departmental coordination, dedicated resources, and the intensity of performance evaluations; the type of participating entities is assigned values based on the number of entity categories; organizational coordination is assigned values based on the degree of institutionalization of coordination mechanisms; information technology levels are assigned values based on the integration of online communication tools and platforms; and the number of objectives is assigned values based on the scope of objectives simultaneously covered by governance tasks.The outcome variable consists of five observable indicators: goal achievement, institutionalization, horizontal or vertical diffusion, public satisfaction, and external recognition.

Table 2: Calibration Rules for Antecedent Conditions and Outcome

Condition / Outcome	0	0.33	0.67	1.00
Government attention	No upper-level support and no cross-departmental linkage	Limited departmental concern only	Visible upper-level support or joint management	Upper-level support, cross-departmental management, dedicated resources, and performance attention all present
Participant type	Single actor category	Two actor categories	Three actor categories	Four or more actor categories
Organizational collaboration	Ad hoc interaction only	Temporary coordination exists	Regular coordination mechanism exists	Institutionalized coordination body or stable collaborative arrangement exists
Information technology level	No digital support	Basic online communication tools	Platform-based reporting/feedback tools available	Integrated digital platform with linked information flow
Number of goals	One governance goal	Two governance goals	Three governance goals	Four or more concurrent governance goals
Governance level (outcome)	Weak goal attainment only	Goal attainment plus one auxiliary indicator	Goal attainment plus two to three auxiliary indicators	Goal attainment, institutionalization, diffusion, satisfaction, and external recognition all substantially present

In Table 2, there are significant differences in each condition across the cases, indicating that the sample possesses the experiential diversity required for cluster analysis. The mean government attention score for high-level governance cases is 0.629, higher than the 0.427 for non-high-level governance cases; the mean for stakeholder participation is 0.406, also higher than the 0.330 in the non-high-level group; the mean for organizational coordination is 0.333, lower than the 0.430 in the non-high-level group. This indicates that organizational coordination does not manifest as a simple linear gain in this study but is more likely to function as a configuring condition that interacts with other factors.

2.3 fsQCA Procedure and Robustness Test

In the identification process, this study first conducts a necessary condition test, followed by truth table construction and identification of intermediate solutions, and finally assesses solution stability through threshold perturbation. The necessary condition test uses a consistency threshold of 0.90; truth table analysis employs raw consistency of 0.85, PRI of 0.70, and case frequency of 1 as baseline settings;Based on these settings, configuration-based solutions are derived separately for high-level governance and non-high-level governance. This approach is more comprehensive than methods that focus solely on successful pathways, as it simultaneously identifies failure pathways, thereby enabling direct testing of causal asymmetry. This paper first employs consistency metrics to assess whether a given combination of conditions can be regarded as a subset of the outcome set, as shown in Equation (1).

$$\text{Consistency}(X \Rightarrow Y) = \frac{\sum_i \min(X_i, Y_i)}{\sum_i X_i} \tag{1}$$

The coverage metric is used to measure the scope of empirical explanation of the result set by the condition combination, as shown in Equation (2).

$$\text{Coverage}(X \Rightarrow Y) = \frac{\sum_i \min(X_i, Y_i)}{\sum_i Y_i} \tag{2}$$

The proportional reduction consistency method is utilized by people to remove conflict structures that at the same time point to one result and its opposite, hence increasing the distinguishing ability of structure recognition, as is shown in Equation (3).

$$\text{PRI}(X \Rightarrow Y) = \frac{\sum_i \min(X_i, Y_i) - \sum_i \min(X_i, 1 - Y_i)}{\sum_i X_i - \sum_i \min(X_i, 1 - Y_i)} \tag{3}$$

In the formula, X_i denotes the membership of the ith case in the condition combination, Y_i denotes the membership of the ith case in the result set, and $min(\cdot)$ denotes the minimum value of the intersection of fuzzy sets. Consistency is used to assess the degree of consistency between a condition combination and the result set, Coverage is used to assess the empirical coverage of the result set by the combination, and PRI is used to eliminate contradictory rows that simultaneously point to a result and its inverse.This paper will not introduce any additional formulae unrelated to the recognition discussed herein; the formulae in the Methods section conclude here. The robustness test consists of three steps: First, adjust the calibration anchors to the 95th, 50th, and 5th percentiles;Second, lower the PRI threshold from 0.70 to 0.65; third, increase the minimum case frequency from 1 to 2. As long as the three types of paths retain their interpretable structure after perturbation, the solution is deemed stable. The implementation of this method is shown in Figure 2.

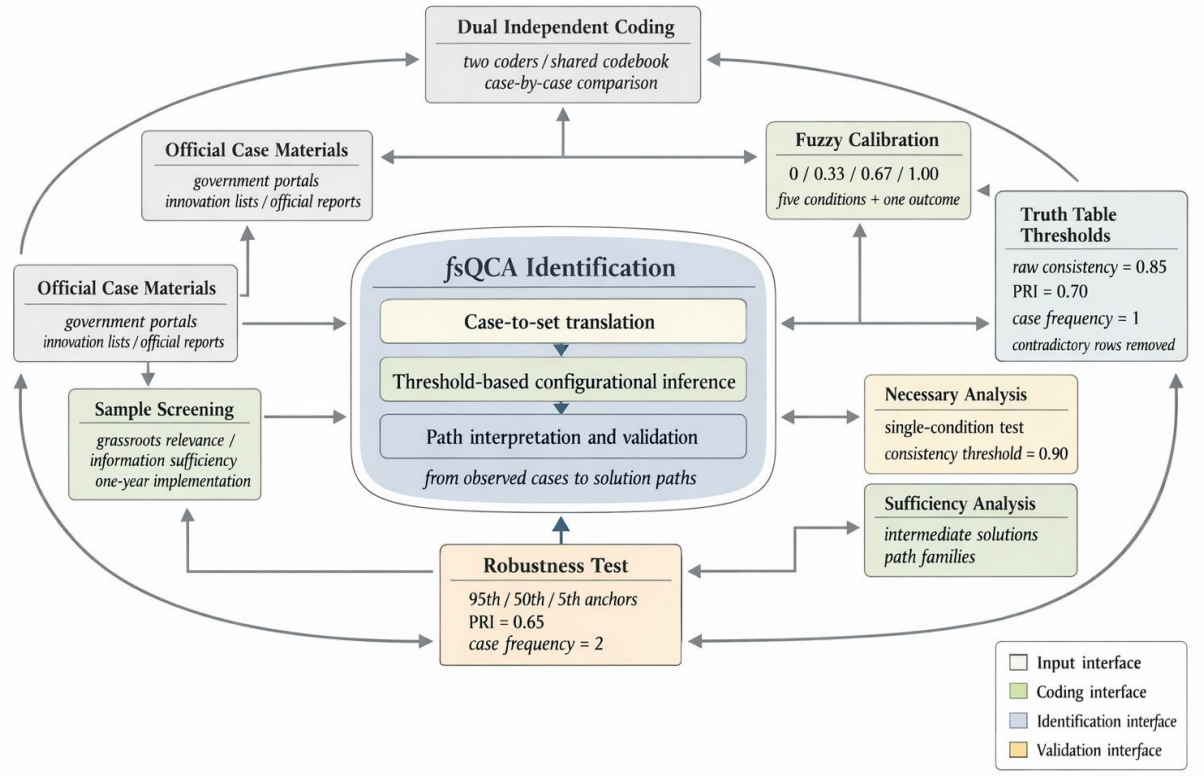

Figure 2: Diagram of the Sampling-Coding-Calibration-Identification-Robustness Method.

Figure 2 organizes the empirical procedure into a closed protocol linking case collection, screening, dual coding, expert review, fuzzy-set calibration, threshold-based identification, and robustness validation, thereby making the execution logic of the configurational analysis transparent and reproducible.

3 Results and Discussion

3.1 Condition Distribution and Necessary Conditions

Before proceeding to path identification, Table 3 first addresses the question: "Are there any single necessary conditions that determine high-level grassroots collaborative governance?"

Table 3: Necessary Conditions for High and Non-High Governance

Outcome set	Condition	Consistency	Coverage	Assessment
High governance	All single antecedents	< 0.900	-	No necessary single condition
Non-high governance	~Participant type (~parfs)	0.926667	-	Necessary background condition
Non-high governance	Other single antecedents	< 0.900	-	Not necessary

Through the combination of Table 2 and Table 3, we can find that for high-level governance, there do not exist any necessary single conditions whose consistency score exceeds 0.90. This points out that high achievement is unable to be explained only by any one individual factor. On the opposite side, the entity type with low participation in non-high-level governance-that is, ~parfs-obtains a consistency value of 0.926667, therefore it forms a necessary background condition for non-high-level governance. This result gives us the information that not enough participation does not certainly directly cause bad achievement, but it greatly cuts down the space for other situations to carry out cooperative interaction. Figure 3 further carries out comparison on the differences of average numerical values of situations between high-level and not high-level cases.

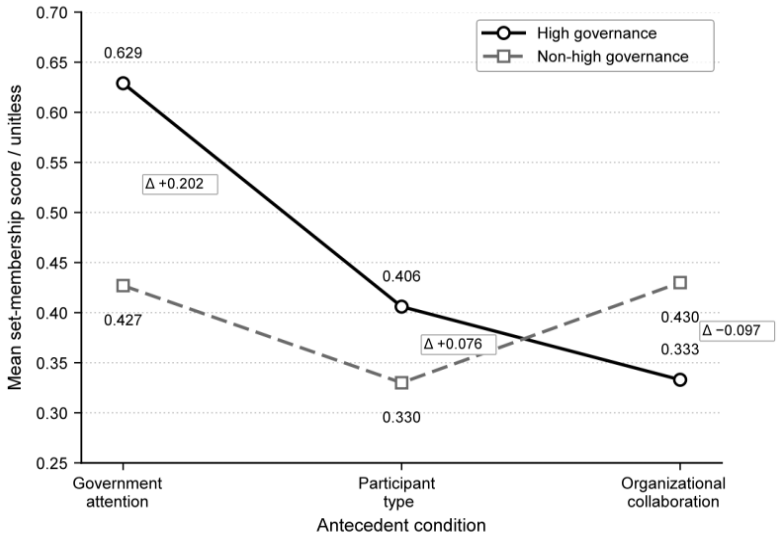

Figure 3: Comparison of Mean Profiles between High and Non-High Governance.

In Figure 3, the mean value for government attention in the high-level group is 0.629, higher than the 0.427 in the non-high-level group; the mean value for participant type in the high-level group is 0.406, also higher than the 0.330 in the latter; the mean value for organizational synergy, however, shows an inverse difference, with 0.333 in the high-level group and 0.430 in the non-high-level group.This result has two implications: First, government attention and participation expansion remain important prerequisites for high-level governance; second, organizational coordination does not exhibit a simple positive net effect in this study; rather, it is more likely to interact with target load, technical conditions, and participation structure. This also indicates that subsequent analysis must return to the configuration level rather than remain at the univariate comparison stage.

3.2 Sufficient Configurations of High-Level Governance

Following the examination of necessary conditions, Tables 4 and 5 address the question: "Which combinations of conditions are sufficient to produce high-level grassroots collaborative governance?"Table 4 shows that the five antecedent conditions can form 32 logical paths, 14 of which were empirically observed in the sample. Several logical paths simultaneously pointed to both high-level and non-high-level outcomes due to low PRI values; this study excluded them prior to minimization to ensure that the solution items had clear interpretive boundaries.

Table 4: Truth Table Settings and Solution Extraction Rules

Item	Value	Interpretation
Number of antecedent conditions	5	government attention, participant type, organizational collaboration, information technology level, number of goals
Logically possible rows	32	2^5 combinations
Empirically observed rows	14	Rows supported by cases
Raw consistency threshold	0.85	Baseline threshold for sufficiency analysis
PRI threshold	0.70	Used to screen contradictory rows
Minimum case frequency	1	Baseline frequency cutoff
Treatment of contradictory rows	Excluded	Rows with low PRI were removed before minimization
Solution types extracted	High governance; non-high governance	Used to test causal asymmetry
Robustness check 1	95th/50th/5th percentile anchors	Calibration-anchor perturbation
Robustness check 2	PRI = 0.65	Threshold perturbation
Robustness check 3	Case frequency = 2	Low-frequency path elimination test

Table 5 makes clear that the overall resolution for high-level governance possesses a consistency of 0.976462 and a coverage of 0.855625, thus it indicates that the confirmed configurations cover the majority of high-level cases, hence they display extremely low internal non-consistency.

Table 5: Configurational Paths of High-Level Grassroots Collaborative Governance

Path	Family	Core empirical logic	Consistency	Raw coverage	Unique coverage
Overall solution	-	High-level governance solution set	0.976462	0.855625	-
C1a	Authority-driven	Strong government attention compensates for weak collaborative infrastructure in concentrated governance settings	-	-	0.188750
C1b	Authority-driven	Strong government attention remains central, but the path is less differentiated than C1a	-	-	0.063750
C2	Autonomy-driven	High organizational collaboration + high IT level + high goal load + low participant type	1.000000	0.311875	0.085000
C3a	Technology-driven	High IT level + high goal load + high participant diversity, with weak organizational collaboration	1.000000	0.414375	0.041875
C3b	Technology-driven	High IT level + high goal load + high participant diversity, supported by stronger government attention	1.000000	0.414375	0.021250

Note: The mean values for the Authority-driven family are 0.792 for government attention, 0.208 for participant type, 0.124 for organizational collaboration, 0.334 for information technology, and 0.375 for number of goals; for the Autonomy-driven family, the mean values for organizational collaboration and IT are both 0.835; For the Technology-driven family, the mean values for participant type, number of goals, and IT are 0.918, 1.000, and 0.835, respectively.

Further comparison reveals that the five solution items can be grouped into three path categories. The first category is the authority-driven path. This road possesses a common foundation of high governmental attention, with C1a's special coverage reaching 0.18875 which is the highest among all high-level roads, hence this indicates that this road has the most strong discriminative ability. The mean government attention for this path family is 0.792, while the mean participant type is only 0.208, suggesting that it relies more on administrative priorities and task focus rather than broad stakeholder expansion.The second category is the autonomy-driven path, corresponding to C2. This path has a mean of 0.835 for both organizational coordination and information technology, maintaining perfect consistency; its raw coverage is 0.311875 and its unique coverage is 0.085. While its coverage is less extensive than that of the technology-driven path, it exhibits greater internal stability. The third category is the technology-driven path, corresponding to C3a and C3b. Both paths have a raw coverage of 0.414375, the highest among all high-level paths; however, their unique coverage is only 0.041875 and 0.02125, respectively, indicating a broad coverage with high overlap.The mean values for the number of participating entities, the number of objectives, and the level of

information technology within this path family are 0.918, 1.000, and 0.835, respectively, indicating that it is better suited for complex tasks involving multiple entities, multiple objectives, and high coordination costs. Figure 4 compares raw coverage and unique coverage on the same plane.

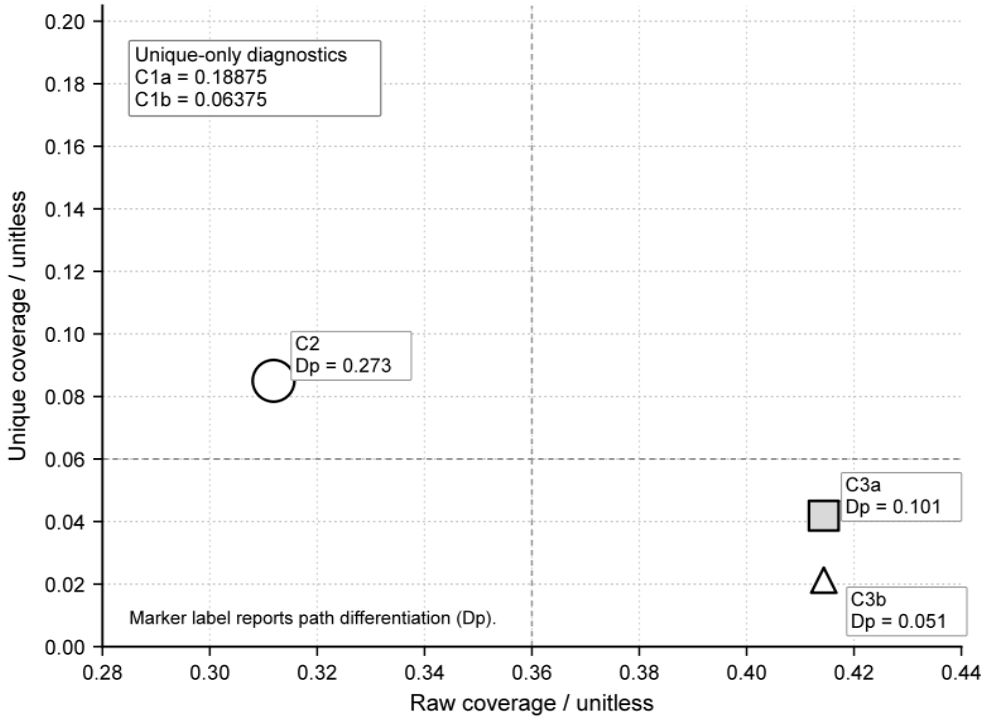

Figure 4: Raw Coverage-Unique Coverage Map of High-Governance Paths.

In Figure 4, C1a is located within the "high discriminative ability" region, hence this indicates that the pathway which is driven by authority possesses stronger independent explanation capability; C3a and C3b are situated in the "high coverage but high overlapping" region, which shows that technical conditions undertake a coordinating basic establishment function in high-level governance, and only can be stably changed into performance outcomes after being coupled with conditions such as government attention or expanded participation; C2, on the opposite side, is situated in the "medium coverage but high stability" region, which demonstrates that the path pushed forward by autonomy possesses a smaller scope of experience, but it exhibits more powerful internal consistency. This evaluation follows the institution-technology joint construction logic that is emphasized in research of digital cooperative projects and data cooperation, hence it conforms to newest findings regarding co-design, participation frameworks, and network effectiveness.

3.3 Non-High Configurations, Robustness, and Discussion

To test for causal asymmetry, Table 6 further reports the intermediate solutions for non-high-level grassroots collaborative governance.

Table 6: Configurational Paths of Non-High Governance

Path	Core empirical pattern	Consistency	Raw coverage	Interpretation
NC1	Low government attention + low participant type + inadequate coordination support	-	0.555556	Common non-high path under weak mobilization conditions
NC2	High goal load + low participant type + low organizational collaboration + low government attention	-	0.627778	Most common failure path
NC3	Low government attention + low participant type + high goal load	-	0.221111	Smaller but still interpretable non-high path

Note: Among the three non-high-level paths, "low government attention" and "low participant type" recur frequently, and two of them simultaneously retain "high goal load."

In Table 6, the NC2 possess the original coverage of 0.627778, which is the highest among the three not high-level pathways; The NC1 possesses an original coverage value that is 0.555556; and NC3 possesses a primitive coverage value of 0.221111. These three access roads together prove that low government attention and low participant category appear many times, therefore, two of them also have the characteristic of high goal burden. This shows that the going-down of basic level governance effect is not a reflection image of high-effect roads; On the contrary, the more frequently seen situation is that governance work items have gotten bigger, but the ability for public participation, support from organizations, and attention from the government have not followed up quickly enough. The ~parfs variable in the necessary condition test responds to NC2 at this place: not enough participation makes the basic background of failure roads, and high target burden enlarges the bad influences of these background conditions. Figure 5, together with the robustness tests, gives answer to the problem whether these roads keep stable. This research respectively made adjustment to the calibration anchor point, PRI threshold value, and minimum case occurrence frequency.

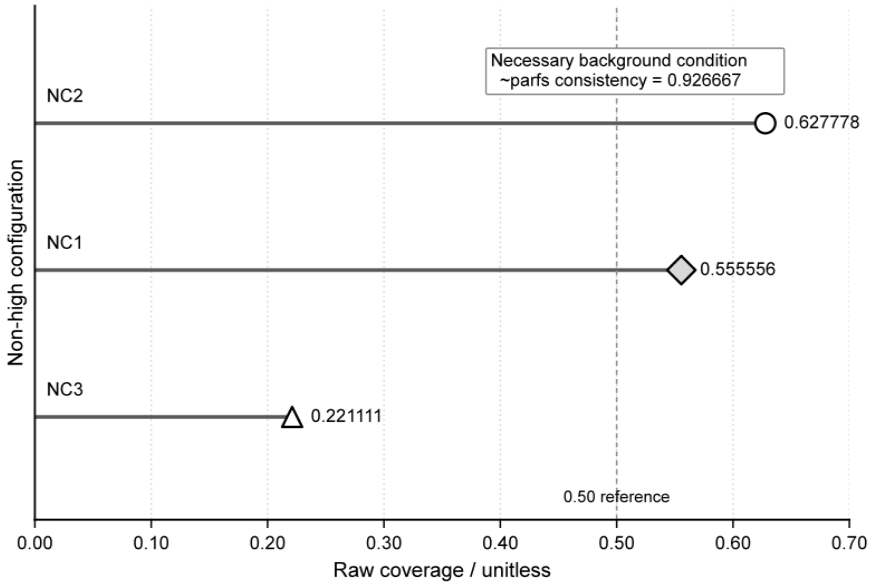

Figure 5: Coverage Comparison of Non-High Governance Paths.

In Figure 5, when the calibration anchor is adjusted to the 95th, 50th, and 5th percentiles, the structural composition of the three high-governance pathways remains substantially unchanged;when the PRI threshold was lowered from 0.70 to 0.65, the core relationships of authority-driven, autonomy-driven, and technology-driven paths remained intact; and when the minimum case frequency was increased from 1 to 2, some low-frequency paths were eliminated, but the three-category path framework still held. Thus, it can be concluded that the configuration results identified in this paper exhibit strong robustness.

From a theoretical perspective, the discussion in this paper can be summarized in three points. First, there is no single necessary condition for high-level grassroots collaborative governance; governance performance is more akin to a joint outcome triggered by multiple conditions.Second, authority, autonomy, and technology are not mutually exclusive governance models; rather, they function as three distinct coordination mechanisms: the authority-driven path corresponds to political prioritization and administrative integration; the autonomy-driven path corresponds to stable community-based coordination structures; and the technology-driven path corresponds to low-cost connectivity and cross-boundary collaboration in complex scenarios. Third, The data in this paper, derived from a cross-sectional case design, supports the conclusions regarding the "coexistence of pathways" and "pathway differences," but is insufficient to directly support the strong conclusion that "pathways evolve in a sequential manner." Recent research on the political dimensions of collaborative governance, trust networks, and digital collaboration also indicates that differences in governance pathways are primarily reflected in variations in institutional conditions and resource structures, rather than in unidimensional, stage-based progression.

4 Conclusion

This paper constructs a calibrated, identifiable, and comparable configurational analysis framework centered on the formation logic of grassroots social collaborative governance performance, and conducts empirical testing using 25 cases from the Southwest region. The research indicates that grassroots collaborative governance performance does not depend on a single condition, but is jointly generated by different combinations of government attention, participation structures, organizational coordination, information technology, and goal load.

(1) This study achieved a unified treatment of samples, conditions, and outcomes at the organizational level. By incorporating cases from different regions, governance scenarios, and administrative levels, the study obtained sufficient sample heterogeneity for aggregate analysis and condensed the abstract issue of collaborative governance into five observable conditions and one outcome variable.

(2) On the aspects of research method and outcome, this research finds three roads toward high-level governance: they are pushed by authority, pushed by self-rule, and pushed by technology. The entire solution consistence is 0.976462, thus the coverage is 0.855625; Among these, the pathway that is led by authority displays the highest distinguishing ability, the pathway that is led by autonomy shows the firmest stability, hence the pathway that is led by technology possesses the broadest coverage but has a relatively high level of overlapping. At the same time, the necessary character of ~parfs and the high coverage degree of NC2 in non-high-level governance together show that, the combination of not enough participation and high target burdens therefore is an important source of risk for grassroots governance to fail.

(3) This study also has limitations. The sample remains a cross-sectional configuration of small to medium-sized samples; the conclusions are primarily intended to identify pathway differences and explain joint effects, and are not suitable for directly deriving pathway evolution sequences. Future research could be advanced through longitudinal tracking, regional

expansion, and more granular digital collaboration indicators to examine the conditions for transition and stability boundaries of different pathways over time.

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