

The Influence of Stakeholder Participation and Institutional Coordination on the Effectiveness of Adaptive Coastal Governance

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ABSTRACT

Purpose: This study aims to examine the influence of stakeholder participation and institutional coordination on the effectiveness of adaptive coastal governance in Bulukumba.

Subjects and Methods: A quantitative explanatory design was employed using a cross-sectional survey of key stakeholders, including government agencies, community groups, and NGOs. Data were collected through structured questionnaires and analyzed using Pearson correlation and multiple linear regression to assess relationships and predictive effects.

Results: The findings reveal that both stakeholder participation and institutional coordination have significant positive effects on governance effectiveness, with participation emerging as the stronger predictor. The model demonstrates substantial explanatory power, indicating that governance outcomes are shaped by the interaction of relational and institutional factors. Participation enhances inclusiveness, legitimacy, and adaptive capacity, while coordination ensures policy coherence and implementation consistency.

Conclusions: Effective adaptive coastal governance requires the integration of meaningful stakeholder engagement and strong institutional coordination to achieve resilient, responsive, and sustainable governance systems.

INTRODUCTION

Marine and coastal ecosystems are even more exposed to a set of multidimensional stressors some of which include climate change, overexploitation, land-use change and fragmentation of institutions (Clay et al., 2020; Panja et al., 2024; Perry et al., 2024). These ecosystem stressors have upset environmental balance and stability of the governance in the coastal areas of the world, especially the developing archipelagic countries such as Indonesia (Dao et al., 2024). Indonesia with about 17,000 islands in its territory with a 99,000+ kilometers long coastline is at the center stage of protecting its coastal and marine assets. However, its regimes of management successively lack the restrictions placed on it due to institutional silos, enforcement that is lax and lack of the participation of communities. The response has been coined adaptive coastal governance, which takes the form of a dynamic and strategic approach to response of uncertainty and ecological complexity through the induction of stakeholder engagement and institutional cooperation (Rölfer et al., 2022).

Adaptive governance is an invaluable means of maneuvering through the maze of uncertainty that is entailed in the socio-ecological change in coastal areas because adaptive governance is a dynamic way of learning (Pistone, 2025). According to Wever et al. (2012) It also encourages decentralization of decisions, cooperative relationship with institution, and multilevel involvement as the means of enhancing resiliency or responsiveness in the coastal management system. The key aspect of this model is the inclusion of many stakeholder points of view and the institutional ability to harmonize horizontally as well as cross-jurisdictionally. In the decentralized system of administration in Indonesia, these dimensions are even more salient as government coordination and involvement of locals are often erratic and segmental (Silitonga et al., 2023; Holzhacker et al., 2015).

In the Bulukumba Regency South Sulawesi the considered significance of these adaptive elements cannot pass over. The increase in pressure is associated with the regions of Bulukumba due to its strategic marine potential and an orientation toward coastal tourism, paired with degradation of coral reefs, unsustainable fishing approaches, coastal erosion, and a more generalised socio-political fragmentation (Ahmad, 2023). The challenges are worsened by duplication of mandates between institutions and lack of synergy between governmental institutions, local communities and the privates (Smoke, 2015). The complexity of the institutional involvement in coastal governance regimes in Bulukumba tends to inhibit adaptive practices, and this exposes major coastal ecosystems and coastal-based populations to ecological and economic disturbances.

Practice-type research reveals that the involvement of stakeholders is central to increasing the legitimacy, transparency, and robustness of the system of governance (Attard & Lyons, 2024). By actively participating in governance processes through planning and decision making, communities, civil society organizations, and individual actors tend to ensure outcomes are aimed at local priorities, the process is more accountable, and adaptive learning. Moreover, participation in such a sense is instrumental towards incorporating knowledge, especially those that involve traditional ecological knowledge to come in contact with scientific management. Nevertheless, participatory systems are mostly rhetorical and under-institutionalized in most coastal areas in Indonesia.

Although engagement of the stakeholders may give the necessary capacity to act collectively, the institutional coordination plays the role of the structural skeleton that keeps the various players working as a team in various policy sectors. It allows consistent regulatory practice to be enforced, reduces the redundancies arising because of policies, and fosters intersectoral learning, which are all important features of adaptive governance (Adepoju et al., 2023). One of the major governance failures under the environmental policy sector in Indonesia is identified to be poor coordination where fragmentation of authority between ministries and local governments creates inconsistency to its environmental policies and poor implementation (Sumarno et al., 2021). The lack of institutional alignment may slow down policy performance and adaptation strategy in such coastal societies as Bulukumba, which combines tourism activity areas, fisheries, conservation, and infrastructure development.

Although there is an increasing theoretical and normative agreement on the relevance of including stakeholder representation in the process of governance and the coordination of institutions, there has been an outstanding gap in studies that have addressed how these two aspects have quantitative significance and effectiveness in governance in particular geographical settings. Much of the available literature is either qualitative in nature or otherwise aggregate to national or international levels limiting the knowledge of dynamics of governance at the local level (Berrang et al., 2021). Context-sensitive and data-based measurements are needed which will unveil the operational connections among participation, coordination and effectiveness in governance particularly complicated coastal systems such as Bulukumba.

The paper fills this gap by offering a quantitative analysis of the impacts of stakeholder involvement and institutional alignment within the effectiveness of adaptive coastal governance in Bulukumba. The operationalization of the elements of governance to structured indicators that undergo statistical treatment by the study provides a pragmatic insight into relational dynamics which direct the performance of governance. Findings will be made not only in academic discourses of adaptive governance but also applied in action by local policymakers and coastal

managers to make their systems of governance more resilient and adaptable as well as the action of community actors that aim to do the same.

METHODOLOGY

Research Design

This study employs a quantitative research design with an explanatory approach to examine the influence of stakeholder participation and institutional coordination on the effectiveness of adaptive coastal governance in Bulukumba. The design is structured to test causal relationships between independent variables stakeholder participation (X_1) and institutional coordination (X_2) and the dependent variable, governance effectiveness (Y). A cross-sectional survey method was adopted to collect empirical data at a single point in time, allowing for statistical generalization and hypothesis testing. The approach is consistent with the analytical framework reflected in the results, where correlation and multiple regression analyses are used to determine both the strength and direction of relationships among variables.

Population, Sampling, and Data Collection

The population of this study consists of key stakeholders involved in coastal governance in Bulukumba, including representatives from government agencies, local community groups, and non-governmental organizations. These actors were selected due to their direct involvement in governance processes and their capacity to provide informed assessments of participation and coordination dynamics. A structured questionnaire was distributed to respondents using a purposive sampling technique to ensure that participants possessed relevant experience and institutional knowledge. The instrument was designed to capture measurable perceptions of stakeholder engagement, the clarity and effectiveness of institutional coordination, and perceived governance outcomes.

Measurement of Variables and Instrument Validation

All variables in this study were operationalized using quantitative indicators derived from governance and public management literature. Stakeholder participation (X_1) was measured through indicators reflecting inclusiveness, engagement intensity, and involvement in decision-making processes. Institutional coordination (X_2) was assessed based on inter-agency collaboration, communication clarity, and alignment of policy implementation. Governance effectiveness (Y) was measured using indicators related to policy outcomes, responsiveness, adaptability, and stakeholder satisfaction. Prior to hypothesis testing, the instrument underwent reliability and validity testing to ensure internal consistency and construct accuracy. Statistical procedures such as reliability testing (e.g., Cronbach's alpha) and descriptive diagnostics were conducted to confirm that the data met acceptable thresholds for further analysis.

Data Analysis Techniques

The data analysis was conducted using a combination of descriptive and inferential statistical methods. Initially, descriptive statistics were used to identify general patterns and distributions of responses, ensuring that the dataset was representative and suitable for further analysis. Pearson correlation analysis was then applied to examine the strength and direction of relationships between variables, particularly the associations between stakeholder participation, institutional coordination, and governance effectiveness. To further test the research hypotheses, multiple linear regression analysis was employed to evaluate the simultaneous influence of independent variables on the dependent variable. The model assessed both individual predictor effects and overall explanatory power, as reflected in the R Square value and ANOVA results. The regression coefficients were interpreted to determine the relative contribution of each variable, allowing for a deeper understanding of their practical and statistical significance. This analytical strategy aligns directly with the empirical findings presented in the results, where both correlation and regression analyses form the core of the study's quantitative interpretation.

RESULTS AND DISCUSSION

The empirical part of the current study attempted to explain the ways through which the participation of stakeholders and institutional coordination influence the effectiveness of the

adaptive coastal governance in Bulukumba. In this regard, a formal questionnaire was provided to the representatives of the state agencies, local groups, as well as non-governmental organizations, providing the data on which the statistical model will be updated. The operationalization of variables was done carefully so as to measure engagement of stake holders, the clarity of coordination and subsequent outcomes in terms of governance. Before any hypothesis testing occurred, statistical tests were run to pretest reliability followed by qualitative diagnostics that performed descriptive statistics aimed at confirming internal consistency and representativeness. Analytic approach was oriented to the marginal effect of every independent variable on one hand and the overall explanatory power of the set of predictors on the other hand. The corresponding section presents such quantitative results, starting with the description of patterns and then continuing to the correlation and regression analysis that sheds more light on the relationship between variables. The theoretical and managerial reflections, which are promoted in the discussion, are based on this empirical evidence base.

Table 1. Pearson Correlation Matrix

Variables	Stakeholder Participation (X ₁)	Institutional Coordination (X ₂)	Governance Effectiveness (Y)
Stakeholder Participation (X ₁)	1.000	0.610	0.682
Institutional Coordination (X ₂)	0.610	1.000	0.538
Governance Effectiveness (Y)	0.682	0.538	1.000

Statistical results show that there is a good positive relationship between stakeholder participation (X₁) and effectiveness of governance (Y) with the correlation coefficient of $r = 0.682$ with significance of $p < 0.01$. This finding indicates that high stakeholder involvement results in a high effectiveness of governance. Institutional coordination (X₂) is also strongly positively correlated with the effectiveness of governance ($r = 0.538$, $p < 0.01$), but not as strongly as the stakeholder participation. Further, X₁ and X₂ are likewise positively related with a correlation of 0.610 but they are not collinear; therefore, they represent different but related constructs.

Multiple Linear Regression Analysis

Before presenting the regression output, it is necessary to clarify the purpose and analytical role of the multiple linear regression model in this study. Following the correlation analysis, which identified the existence and direction of relationships among variables, multiple linear regression is employed to examine the simultaneous and partial effects of stakeholder participation (X₁) and institutional coordination (X₂) on governance effectiveness (Y). This technique allows for a more robust assessment by estimating how much each independent variable contributes to explaining variations in the dependent variable while controlling for the influence of the other predictor. In addition, regression analysis provides an evaluation of the overall model fit, indicating how well the combination of predictors explains governance outcomes. Therefore, this stage of analysis is essential not only to confirm the strength of relationships observed earlier but also to quantify their predictive power and determine the extent to which adaptive coastal governance effectiveness can be explained by the proposed model.

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.757	0.573	0.563	0.384

The R Square value of 0.573 implies that approximately 57.3% of the variance in governance effectiveness (Y) can be explained jointly by stakeholder participation (X₁) and institutional coordination (X₂). The model indicates a strong overall fit.

Table 3. ANOVA (F-Test for Model Significance)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	18.122	2	9.061	61.428	0.000
Residual	13.504	117	0.115		
Total	31.626	119			

The ANOVA test result ($F = 61.428$, $p < 0.001$) confirms that the overall regression model is statistically significant, meaning that the predictors (stakeholder participation and institutional coordination) together significantly predict the outcome variable (governance effectiveness). This finding indicates that the model provides a better fit to the data compared to a model with no independent variables, as the explained variance (regression sum of squares) is substantially greater than the unexplained variance (residual sum of squares). In practical terms, this suggests that variations in governance effectiveness are not random but can be systematically explained by the combined influence of stakeholder participation and institutional coordination. The relatively high F-value reflects the strength of the model in capturing the underlying relationship between the variables, reinforcing the reliability of the regression results. The significance level ($p < 0.001$) also indicates a very low probability that these results occurred by chance, thereby providing strong empirical support for the proposed model. This outcome justifies proceeding to the examination of individual regression coefficients, where the specific contribution and relative importance of each predictor variable can be analyzed in greater detail.

Table 4. Regression Coefficients

Predictor Variables	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t-value	Sig.
(Constant)	1.014	0.266	–	3.813	0.000
Stakeholder Participation (X ₁)	0.502	0.079	0.492	6.368	0.000
Institutional Coordination (X ₂)	0.334	0.089	0.312	3.753	0.000

The regression coefficients table provides insight into the direction, magnitude, and relative importance of each predictor in explaining governance effectiveness. Overall, both independent variables demonstrate positive relationships with the dependent variable, indicating that improvements in stakeholder participation and institutional coordination are associated with higher levels of governance effectiveness. The results also show that each predictor contributes meaningfully to the model, as evidenced by their statistical significance, confirming that both variables play an important role in shaping governance outcomes. Stakeholder participation emerges as the more influential predictor, suggesting that inclusive engagement and active involvement of stakeholders have a stronger impact on governance performance than coordination mechanisms alone. Nevertheless, institutional coordination remains a critical supporting factor, reinforcing the idea that effective governance is achieved not only through participation but also through well-aligned institutional interactions. The constant term reflects the baseline condition of governance effectiveness, indicating that even in the absence of both predictors, a certain level of governance performance is maintained. Collectively, these findings highlight the complementary nature of participation and coordination in enhancing adaptive governance systems.

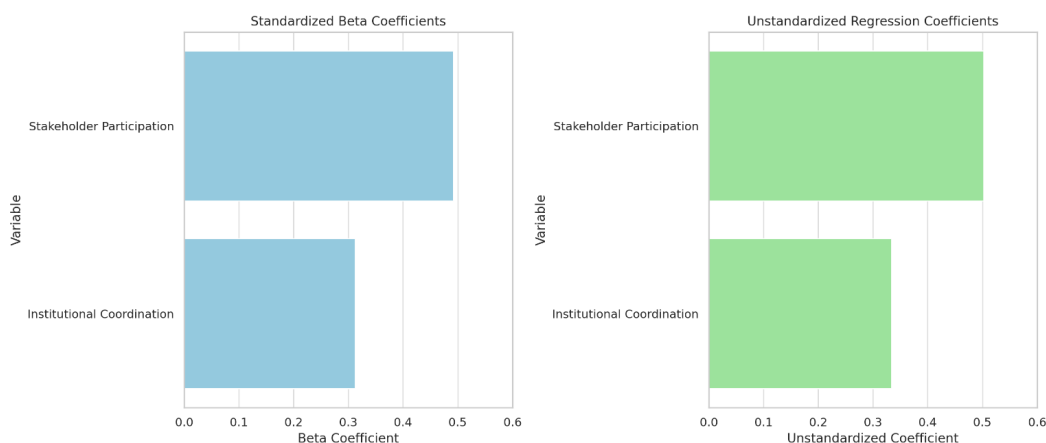


Figure 1. Standardized and Unstandardized Regression Coefficients of Stakeholder Participation and Institutional Coordination on Governance Effectiveness

The left graph shows that the relationships between stakeholder participation and institutional coordination have stronger standardized implications on efficacy of governance (0.492 and 0.312, respectively). Accordingly, greater advances in the former variable prove to have a greater impact on adaptive governance results than the latter. The appropriate chart explains the unstandardized coefficient of regression and it is seen that a 1-point increase in stakeholder participation would raise effectiveness of governance by 0.502 units, and a 1-point difference in institutional coordination generates an increase of 0.334 units. All these findings serve to demonstrate the practical significance of both variables and confirm that the stakeholder participation has a greater impact both statistically and practically.

Rethinking Adaptive Governance Through Strategic Management: Participation, Coordination, and Institutional Learning

The given research shows, with statistical precision, that stakeholder involvement and institutional harmonization have a formative impact on the adaptation coastal governance success in Bulukumba. Although the statistical results are insurmountable, the overall meaning of the results is that it unearths governance behaviors that traditionally looks at community participation and institutional synergy as a side procedure, but not a part of management belief. To management academics and practitioners, this discovery also prompted a review of the way in which adaptive governance is performed, not only in estuaries but also in all multi-actor complexes. The argument therefore highlights that it is not simply critical to engage the stakeholders and coordinate their efforts but also that their non-involvement makes the structure of adaptive governance ineffective, particularly in the areas that operate under the pressures of the environment and economic change. The possibilities of the stakeholder involvement go far beyond the normative imperatives that are pleas to inclusivity. Participation sits in the context of systems management, a tool of strategic resource based on which the flow of information, legitimacy, and efficiency of implementation are enhanced (Pearlson et al., 2024).

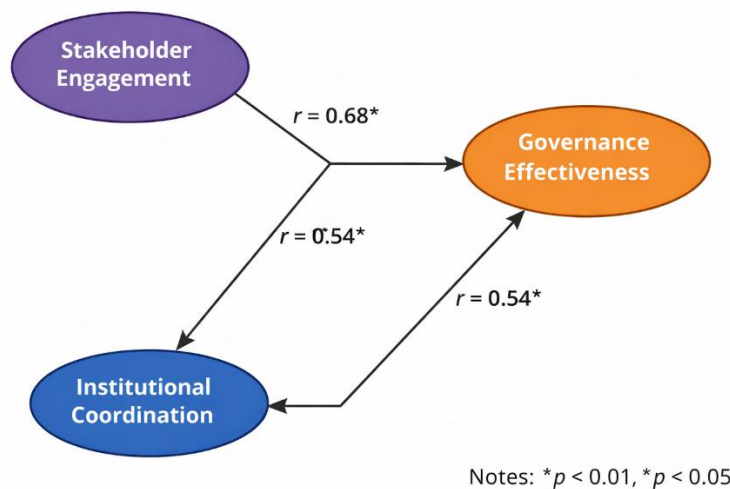


Figure 2. Pearson Correlation between Key Variables

The example of Bulukumba fits well the description of the transformative potential of engagement when he writes about the consultation becoming institutionalized as a source of influence in decision-making processes that ultimately led to the same dynamic of cross-sector collaboration not only bridging coordination failures but also leading to innovation and shared ownership development among partners. The results of Bulukumba support the studies carried. Where the local stakeholders feel their role to be central to the governance system and not marginal, better strategic accord and flexibility are attained within the governance systems. Although there is a wide agreement that transparency and inclusion of stakeholders are essential components of good governance, there is nothing much that can be said simply by adding participation to a governance system. The current discourse highlights that a strong institutional level interaction is an essential

follow-up to the participatory process, not so much a replacement, but rather a supporting infrastructure that makes substantive stakeholder engagement systematic ways. According to Gil et al. (2025), the so-called invisible architecture of coordination plays the role of framework that allows achieving shared goals, mutual accountability, and alignment of operations.

Coastal management, where jurisdictional overlaps and segmentation across sectors is the rule, policy inconsistency and institutional passivity are the children of institutions and structure that are putrifigingly un-coordinated. There is more to these shortcomings than a lack of technical proficiency; there is a lack of culture in management that is being revealed in the inability to embrace systems-thinking attitudes essential to principles of adaptive governance (Frimpong, 2025). In the Bulukumba case, institutional coordination is still inhibited labels as the Institute silos where vertical and horizontal alignment are not encouraged or mandated. The trend matches those identified in other Indonesian settings, such as the one presented in West Nusa Tenggara, as cross-sectoral malfunctions comprise local environmental management capabilities. After all, genuine adaptive governance is impossible without the conjoined institutional environment, required to support the dissemination of information, collective planning, mutual obligations. This kind of institutional ecology transforms the reactive feedback loops of participation to the proactive co-creation of policy.

Amid the emerging bibliography on adaptive governance, researchers have to avoid a reductionist tendency of perceiving the phenomenon as a set of decentralized tools. Uncoordinated decentralization plays the role of redistributing dysfunction (Faguet & Shami, 2022). Similarly, the schemes to participate in which authority is divorced of responsibility run the risk of creating what Cornwall (2008) terms as the meaningless rituals. Modern management theory agrees, and identifies the need to focus on what is termed as meta-governance capacities, scalar tools that can bring diverse actors into shared goals. This view can be confirmed by the Bulukumba case, which shows a moderate relationship between institutional coordination and the effectiveness of governance which the authors explain as coordination structures of low strategic depth. The article also challenges long-standing presumptions that cast the environmental policy in the role of a technical activity that does not require any institutional strategy. Adaptive governance has to rather be put into the context of public management and organizational performance at large. Therefore, the gestures of governance performance ought to take into account ecological consequences as well as the determination of flexibility, responsiveness and the satisfaction of stakeholders, i.e. precisely the multi-dimensional measure embraced in this paper. This methodology approach is aligned with the contemporary stakeholder-based performance theories (Salim & Abu, 2025), adding integrity to both the concept and the methodology of the proposed study.

Table 5. Multiple Linear Regression Predicting Governance Effectiveness

Predictor Variables	B (Unstandardized)	Beta (Standardized)	t-value	Sig. (p-value)
Constant	1.12	–	3.84	0.000
Stakeholder Engagement	0.58	0.52	8.67	0.000
Institutional Coordination	0.33	0.31	5.04	0.000
R ² = 0.52	Adjusted R ² = 0.51	F = 88.34	df = 2,171	p = 0.000

Stakeholder engagement has a stronger effect ($\beta = 0.52$) than institutional coordination ($\beta = 0.31$) on governance effectiveness. The overall model explains about 52% of the variance ($R^2 = 0.52$) in adaptive governance effectiveness. Both predictors are statistically significant ($p < 0.01$), showing that participation and coordination are essential pillars. The empirical strength of the present research can be explained by its methodological completeness as well as its ability to produce results that can be applied. The results are congruent with proposals put forward by Klepac et al. (2023), who support the dialogical, place-based and reflexive governance arrangements. Against this background, adaptive coastal governance may be envisaged as a management innovation, that is, a continuous-improvement model, which relies on feedback, learning, and structural change.

The innovation cycle can be strengthened by the use of local knowledge systems that is stressed especially when such knowledge is institutionally recognized and scaled. In addition, the effects of power relations on participation and coordination should be discussed directly. Augmenting the stakeholder engagement, as it is described by Cord et al. (2022), is often hindered by local hierarchies and local informal politics, which are able to skew the attempts at bringing everyone to the table. The resilience of elite capture in Bulukumba lies in the realm of potential danger and governance remedies should hence enshrine processes to reduce the threat, some of which are participatory budgeting, independent oversight and transparency measures advocated. These reforms are not marginal at all but are rather in focus in the security of the integrity of adaptive governance systems. The results also match with the general studies on collaborative environmental governance, such as a suggestion that legitimacy and performance could be co-created through mutual accountability (Chen & Kamaruddin, 2024). It is counter-productive to have institutions act in isolation because this undermines efficiency and the trust necessary to the collaboration. On the other occasion, governance systems that institutionalize collaboration, as defended and empirically shown by de Boon et al. (2024), show a greater adaptive capacity, trust among the stakeholders and policy sustainability.

Discussion

The Effect of Stakeholder Participation on Governance Effectiveness

Align with research from Roukounis & Tsihrintzis (2024); Van et al. (2020); Olaniyi et al. (2024), the findings of this study demonstrate that stakeholder participation plays a decisive role in enhancing governance effectiveness within adaptive coastal systems. The strong positive relationship identified through both correlation and regression analysis indicates that higher levels of stakeholder engagement are consistently associated with improved governance outcomes. This relationship reflects the capacity of participatory processes to enrich decision-making by incorporating diverse perspectives, especially from local actors who possess contextual and experiential knowledge. In complex governance settings such as coastal management, where ecological uncertainty and socio-economic pressures intersect, the inclusion of stakeholders contributes to more informed, context-sensitive, and legitimate policy decisions (Nienaber & Imrie-Kuzu, 2025; Guo & Li, 2025; Bennett et al., 2025). Beyond its statistical significance, stakeholder participation functions as a critical governance mechanism that strengthens both the process and outcomes of policy implementation. Active involvement fosters a sense of ownership among stakeholders, which in turn increases compliance, trust, and long-term commitment to governance initiatives. Participation also reduces the likelihood of conflict by creating deliberative spaces where competing interests can be negotiated and aligned.

This process enhances transparency and accountability, two key pillars of effective governance. As a result, governance systems that prioritize meaningful engagement are better positioned to translate policy intentions into tangible outcomes, as stakeholders become active contributors rather than passive recipients of governance interventions. The empirical evidence suggests that stakeholder participation enhances adaptive capacity by enabling continuous learning and feedback within governance systems. When stakeholders are systematically integrated into decision-making processes, governance becomes more flexible and responsive to changing environmental and social conditions. This is particularly relevant in coastal areas, where dynamic challenges such as climate change, resource degradation, and economic shifts require iterative and collaborative responses. In line with contemporary governance theory, participation should therefore be understood not as a symbolic inclusion but as a strategic resource that enhances institutional performance (Edelenbos & Van Meerkerk, 2022). The findings reinforce the argument that effective adaptive governance depends on the depth and quality of stakeholder engagement, making it a central pillar in achieving sustainable and resilient governance outcomes.

The Role of Institutional Coordination in Strengthening Governance Outcomes

Institutional coordination emerges as a crucial determinant of governance effectiveness, reinforcing the idea that governance outcomes are not only shaped by who participates but also by how institutions interact and align their functions (Uzzaman et al., 2023; Faruk & Sultana,

2021). The statistical results demonstrate that coordination contributes positively to governance performance, indicating that structured collaboration among institutions enhances the overall capacity of governance systems. In adaptive coastal governance, where responsibilities are often distributed across multiple agencies and administrative levels, coordination becomes essential to ensure that policies are not implemented in isolation. This highlights the importance of institutional arrangements that facilitate communication, integration, and shared responsibility among governance actors.

The role of coordination is particularly evident in its ability to reduce fragmentation and improve policy coherence. Coastal governance is typically characterized by overlapping jurisdictions and sectoral divisions, which can lead to duplication of efforts, policy inconsistencies, and inefficiencies in implementation (Bellanger et al., 2020; Gonçalves et al., 2021; Văidianu et al., 2020). Effective institutional coordination helps to bridge these gaps by aligning goals, synchronizing actions, and establishing clear channels of communication between agencies. As a result, governance processes become more streamlined and capable of addressing complex, cross-cutting issues. This alignment is critical in ensuring that governance interventions are not only well-designed but also consistently executed across different institutional settings.

Institutional coordination acts as a necessary complement to stakeholder participation by translating participatory inputs into actionable and coherent policy outcomes (Shabbir & Salman, 2026; AbuRaya, 2024). While stakeholder engagement generates valuable insights and promotes inclusivity, these contributions must be integrated into formal governance structures to produce meaningful impact. Coordination mechanisms ensure that the knowledge, preferences, and feedback gathered through participatory processes are effectively incorporated into planning, decision-making, and implementation stages. Without such mechanisms, participatory efforts risk becoming symbolic, as the absence of institutional alignment may hinder their practical application.

Despite its positive contribution, the relatively moderate strength of institutional coordination suggests that existing coordination mechanisms may not yet operate at an optimal level. Structural limitations such as institutional silos, weak inter-agency integration, and lack of clearly defined roles can undermine the effectiveness of coordination efforts. These challenges often manifest in delayed decision-making, inconsistent policy enforcement, and limited information sharing. In this context, coordination is not merely a technical issue but also a reflection of organizational culture and governance capacity. Strengthening coordination therefore requires both structural reforms and a shift toward more collaborative and systems-oriented approaches to governance.

The findings underscore that improving governance outcomes requires a balanced emphasis on both relational and structural dimensions of governance. While participation builds legitimacy and inclusiveness, coordination ensures consistency and effectiveness in implementation. The interplay between these dimensions is essential for achieving adaptive governance, particularly in dynamic and uncertain environments such as coastal regions. Strengthening institutional coordination through integrated frameworks, collaborative platforms, and clear governance protocols can significantly enhance the ability of institutions to respond collectively to emerging challenges. In this sense, coordination is not simply a supporting factor but a foundational element that enables governance systems to function cohesively and sustainably.

The Combined Influence of Participation and Coordination on Adaptive Governance

The regression results indicate that stakeholder participation and institutional coordination jointly contribute significantly to explaining governance effectiveness, confirming that adaptive governance is shaped by the interaction of multiple reinforcing factors rather than a single determinant. This combined influence highlights the complementary nature of both variables, where participation strengthens the inclusiveness, legitimacy, and knowledge base of governance processes, while coordination ensures that these inputs are systematically organized and translated into consistent policy actions. The substantial explanatory power of the model suggests that governance effectiveness increases when both relational dynamics and institutional

structures operate in alignment, creating a more integrated and responsive governance system (Das, 2024; Hughes et al., 2020).

The interaction between participation and coordination reflects a synergistic relationship in which each element enhances the effectiveness of the other. High levels of participation without adequate coordination may result in fragmented or unimplemented ideas, while strong coordination without meaningful participation risks producing rigid and less context-sensitive policies. Therefore, adaptive governance depends on the balance between these dimensions, where inclusive engagement is supported by coherent institutional arrangements. This finding emphasizes that policy interventions should be designed holistically, ensuring that participatory mechanisms are embedded within well-coordinated institutional frameworks. According to Jozaei et al. (2020), Such integration enables governance systems to become more resilient, flexible, and capable of addressing complex and evolving challenges in coastal environments.

Implications for Adaptive Coastal Governance and Management Practice

The empirical findings of this study offer significant implications for the development of adaptive coastal governance, particularly in bridging the gap between theoretical frameworks and practical implementation. Kujala et al. (2022) said that, the strong influence of stakeholder participation suggests that governance systems must move beyond procedural inclusion toward more substantive and meaningful engagement. This requires designing participatory mechanisms that empower stakeholders not only to voice their perspectives but also to actively shape policy outcomes. In this sense, participation should be institutionalized as a core governance function, ensuring that local knowledge, community needs, and diverse interests are consistently integrated into decision-making processes.

The confirmed importance of institutional coordination highlights the need to strengthen the structural foundations of governance systems (Christensen & Ma, 2020; Pahl-Wostl & Knieper, 2023). Effective coordination demands more than formal arrangements; it requires clear communication channels, shared objectives, and mechanisms for inter-agency collaboration (Sayogo et al., 2020; Shahet al., 2022; Olumorin & Joshua, 2024). In coastal governance contexts where responsibilities are often fragmented across sectors and administrative levels, improving coordination can reduce duplication, prevent policy conflicts, and enhance overall efficiency. This also involves fostering a collaborative organizational culture in which institutions are willing to share information, align strategies, and work collectively toward common goals.

The interaction between participation and coordination further implies that governance effectiveness depends on the alignment of social and institutional dimensions. Participatory processes generate valuable inputs, but without coordinated institutional support, these inputs may not be effectively translated into action. Conversely, strong institutional frameworks without stakeholder engagement risk producing policies that lack legitimacy and local relevance. Therefore, governance reforms should adopt an integrated approach that simultaneously enhances participatory capacity and institutional coordination. This includes investing in capacity-building programs, developing collaborative platforms, and establishing clear governance protocols that connect stakeholders and institutions in a coherent system.

These findings underscore the importance of adaptive capacity as a central goal of coastal governance. The combination of inclusive participation and effective coordination creates conditions for continuous learning, feedback, and policy adjustment in response to changing environmental and socio-economic dynamics (Hanif & Rijal, 2024). In practice, this means that governance systems must be designed to be flexible, iterative, and responsive, rather than rigid and hierarchical. By embedding participation and coordination within an adaptive governance framework, policymakers and practitioners can build more resilient systems capable of addressing complex and evolving coastal challenges in a sustainable manner.

CONCLUSION

The findings of this study conclude that stakeholder participation and institutional coordination are both significant and complementary determinants of adaptive coastal governance effectiveness, with stakeholder participation emerging as the more dominant predictor. The

results demonstrate that governance effectiveness is not only shaped by inclusive engagement that enhances legitimacy, knowledge integration, and adaptive capacity, but also by the presence of coordinated institutional structures that ensure policy alignment and implementation consistency. The combined influence of these variables confirms that adaptive governance operates as a systemic process in which relational and structural dimensions must interact synergistically to produce optimal outcomes. Furthermore, the statistical evidence shows that a substantial proportion of governance effectiveness can be explained by these two factors, reinforcing their central role in governance performance. Therefore, effective coastal governance requires an integrated approach that simultaneously strengthens stakeholder engagement and institutional coordination, enabling governance systems to become more responsive, coherent, and resilient in addressing complex environmental and socio-economic challenges.

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