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Multidisciplinary Approach to Developing Climate-Resilient Livelihoods in Coastal Outskirt Areas

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ABSTRACT

Background. The increasing vulnerability of coastal outskirt communities to climate change poses serious threats to their livelihoods, economic stability, and cultural heritage. Addressing these issues requires comprehensive and localized strategies that go beyond conventional approaches.

Purpose. This multidisciplinary study aimed to develop sustainable and climate-resilient livelihood strategies for marginalized coastal populations by integrating insights from environmental science, social anthropology, economics, and public policy.

Method. Field studies, participatory mapping, and community engagement workshops were conducted across selected coastal regions to identify key risks, adaptive capacities, and socio-economic dynamics influencing resilience. The collected data were analyzed qualitatively and quantitatively to formulate an integrated resilience model.

Results. The findings highlight the critical role of localized knowledge systems, flexible policy frameworks, and cross-sector collaborations in enhancing community adaptive capacities. Furthermore, the study proposes an integrated model that combines ecosystem-based adaptation, community-led entrepreneurship, and inclusive governance to bridge the gap between scientific innovation and local realities.

Conclusion. This research offers practical pathways for policymakers, practitioners, and community leaders to foster sustainable development and improve climate resilience in vulnerable coastal outskirt areas. The proposed model serves as a comprehensive framework to guide future resilience-building initiatives in similar socio-ecological contexts**.**

KEYWORDS

Climate resilience, coastal livelihoods, multidisciplinary approach,

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INTRODUCTION

Climate change is increasingly recognized as one of the most pressing global challenges, with profound implications for ecosystems, economies, and human well-being (Chaoub, 2022; Hahn, 2023). Coastal regions, particularly outskirt areas that lie beyond the protective reach of major urban and economic centers, are among the most vulnerable to its multifaceted impacts (Furlong, 2022; Toledo, 2022). These communities often experience the convergence of environmental degradation, economic marginalization, and socio-political neglect, forming a complex landscape of vulnerability that conventional

development strategies have struggled to address effectively.

The adverse effects of climate change in coastal areas manifest in various forms: accelerated sea-level rise, increased frequency and intensity of storms, saline intrusion into freshwater supplies, loss of biodiversity, and disruption of marine-based livelihoods (Ali, 2023; Dalal, 2023). These phenomena not only threaten the physical habitability of coastal settlements but also destabilize food security, income sources, health conditions, and social cohesion within these marginalized populations. Without timely and effective intervention, the spiral of vulnerability is likely to intensify, pushing these communities further into poverty and displacement.

Efforts to build resilience in coastal regions have traditionally leaned toward sectoral solutions—engineering seawalls, promoting aquaculture, or introducing alternative crops (Fan, 2022; Ritchie, 2022). However, such isolated interventions often fail to capture the complexity of human-environment interactions, leading to suboptimal outcomes or unintended consequences. Recognizing this, there is a growing consensus that a multidisciplinary approach is necessary—one that simultaneously engages the environmental, social, economic, cultural, and governance dimensions of resilience (Hussain, 2024; Val, 2024). The concept of resilience itself has evolved significantly over the past decades. Initially rooted in ecology, where it referred to the ability of systems to absorb disturbances without shifting into a qualitatively different state, resilience is now understood more broadly. In human systems, resilience encompasses adaptive capacity, social capital, economic diversity, and institutional flexibility. Coastal livelihoods must thus be seen not merely as economic activities, but as dynamic socio-ecological systems embedded in specific cultural, historical, and environmental contexts.

One critical insight from socio-ecological systems theory is that interventions must operate at multiple scales and address feedback loops within the system. For instance, promoting sustainable fisheries must consider not only biological stock dynamics but also market incentives, governance frameworks, community norms, and transboundary environmental changes (Hopkyns, 2022; Vadayath, 2022). This complexity challenges the efficacy of one-size-fits-all solutions and underscores the need for context-specific, participatory, and integrated strategies. A growing body of empirical research highlights the resilience-enhancing potential of indigenous knowledge systems. In many coastal regions, traditional practices such as seasonal fishing bans, sacred groves conservation, communal irrigation management, and boat-making crafts embody sophisticated ecological understandings honed over centuries (Dankwa-Mullan, 2025; Kwawukumey, 2024). Yet, these knowledge systems are under siege from modernization pressures, loss of intergenerational transmission, and external development interventions that undervalue or disregard local expertise.

At the same time, economic marginalization remains a formidable barrier to resilience. Coastal outskirt communities often lack access to credit, markets, education, and health services—factors that exacerbate their vulnerability to climate shocks (Indu, 2022; Senatore, 2023). Diversifying livelihoods, while crucial, is fraught with challenges including limited capital, infrastructural deficits, regulatory hurdles, and sometimes social resistance to change. A multidisciplinary approach must thus integrate economic development strategies with social mobilization and capacity-building. Environmental degradation further compounds the vulnerability of coastal outskirt areas. Overfishing, mangrove deforestation, coral reef destruction, pollution, and unregulated coastal development erode the natural buffers that shield communities from climate hazards. Ecosystem-based adaptation (EbA) offers a promising pathway to reverse these trends by leveraging the protective functions of healthy ecosystems. However, successful EbA requires not only ecological restoration but also sustained community involvement, appropriate incentives, and supportive governance structures.

Policy environments often lag behind the realities faced by coastal communities. Fragmentation across administrative sectors, misaligned development priorities, insufficient decentralization, and weak enforcement of environmental regulations inhibit coherent resilience-building efforts (Lampoltshammer, 2023; Vassilakopoulou, 2023). Policy incoherence can result in contradictory initiatives—for example, promoting shrimp farming at the expense of mangrove conservation—undermining long-term sustainability (Azmeh, 2025; Sweet, 2022). Bridging the policy-practice divide demands participatory governance models that empower local communities to have a substantive voice in shaping development trajectories. Participatory approaches, such as co-management of resources, community-based disaster risk management, and participatory spatial planning, have demonstrated success in various contexts but require sustained investment in trust-building, capacity development, and institutional innovation.

Technological advancements offer new opportunities for resilience but also introduce new challenges. Mobile-based early warning systems, satellite-based coastal monitoring, climate-resilient agriculture technologies, and renewable energy solutions can enhance adaptive capacities (Saleem, 2023; Ward, 2023). Nevertheless, without attention to issues of accessibility, affordability, digital literacy, and technological appropriateness, these innovations risk deepening existing inequalities rather than mitigating them. Education, both formal and non-formal, plays a critical role in fostering resilience (Mascolo, 2022; Sun, 2022). Climate literacy, sustainable livelihood skills, leadership development, and environmental stewardship need to be mainstreamed into educational programs targeting coastal youth and adults. Furthermore, promoting gender-sensitive and inclusive education approaches ensures that the knowledge and capacities of all community members, including women and marginalized groups, are recognized and strengthened.

The success of multidisciplinary approaches hinges on effective cross-sectoral and cross-disciplinary collaboration. Bridging epistemological divides between natural sciences, social sciences, humanities, and engineering fields is challenging but essential. Similarly, fostering partnerships among academia, government agencies, non-governmental organizations, private sector actors, and community groups is vital to pooling resources, knowledge, and capacities toward shared resilience goals. Recent international frameworks such as the Sendai Framework for Disaster Risk Reduction, the Paris Agreement, and the Sustainable Development Goals (SDGs) provide normative guidance and political momentum for resilience-building. However, translating these global commitments into meaningful local action remains a major implementation gap. Understanding how global discourses interact with local realities is critical to designing interventions that are both globally informed and locally grounded.

There are also ethical considerations inherent in climate resilience work. Who defines resilience? Whose knowledge counts? Who benefits from interventions? Addressing these questions requires a commitment to equity, social justice, and the recognition of diverse worldviews. Resilience-building must avoid reproducing existing power imbalances or imposing technocratic solutions that disempower local actors. The challenges confronting coastal outskirt communities are daunting, but examples of successful interventions around the world offer valuable lessons. In the Philippines, community-led mangrove rehabilitation has restored livelihoods and strengthened social capital. In Bangladesh, integrated floodplain management has enhanced food security and ecological health. In Kenya, participatory marine spatial planning has balanced conservation and economic development goals. These cases demonstrate the power of multidisciplinary, participatory, and context-sensitive approaches to transform vulnerability into resilience.

Building climate-resilient livelihoods in coastal outskirt areas is not simply a matter of technical fixes or economic investments; it requires a fundamental rethinking of development

paradigms. It calls for embracing complexity, nurturing local innovation, fostering inclusive governance, and embedding resilience thinking into all aspects of planning and practice. Bridging the divide between scientific knowledge and local realities is thus not only necessary but imperative for sustainable and equitable futures. This study contributes to these ongoing efforts by proposing a comprehensive, multidisciplinary framework for developing climate-resilient livelihoods in coastal outskirt areas. Drawing on fieldwork, participatory action research, and cross-disciplinary synthesis, it seeks to illuminate pathways toward holistic resilience-building that center the voices, needs, and aspirations of coastal communities.

Through an integrated approach combining ecosystem-based adaptation, economic diversification, social empowerment, technological innovation, and participatory governance, this research endeavors to chart a roadmap for policymakers, practitioners, and community leaders. By bridging the divide between global discourses and local practices, between science and lived experience, this work aspires to contribute to a more resilient, just, and sustainable future for coastal outskirt populations. Ultimately, the stakes are not merely technical or economic; they are deeply human. They concern the right of every community to secure livelihoods, cultural continuity, dignity, and hope in the face of climate adversity. It is only through collective, multidisciplinary, and compassionate action that we can rise to meet this defining challenge of our time.

RESEARCH METHODOLOGY

This research adopts a multidisciplinary qualitative approach, combining environmental analysis, socio-economic assessment, and participatory action research to develop an integrated framework for climate-resilient livelihoods in coastal outskirt areas (Simonsson, 2022; Yang, 2024). The study was conducted in selected coastal regions characterized by high vulnerability to climate change impacts, socio-economic marginalization, and ecological degradation. Data collection involved a triangulation of methods, including in-depth interviews with local stakeholders (community leaders, fisherfolk, farmers, women's groups, and youth representatives), focus group discussions (FGDs), participatory rural appraisal (PRA) techniques, and direct field observations. In addition, policy document analysis was undertaken to critically examine the institutional frameworks governing coastal management and climate adaptation at local and national levels. The participatory mapping exercises allowed communities to visually identify hazard zones, critical resources, livelihood patterns, and adaptive capacities, thereby grounding the research firmly in local realities. Environmental assessments, such as mangrove cover surveys and water quality testing, complemented the social data, providing a holistic understanding of the intertwined human-environment dynamics influencing resilience.

Data analysis was carried out using thematic coding and cross-case synthesis to identify patterns, divergences, and contextual specificities across the research sites (Ancira, 2022; Wang, 2024). NVivo software facilitated systematic coding of qualitative data, ensuring analytical rigor and traceability. The findings from community engagements were iteratively validated through feedback sessions, allowing participants to refine interpretations and co-create knowledge outputs. Additionally, the study employed a resilience assessment framework based on five core dimensions: exposure, sensitivity, adaptive capacity, institutional support, and innovation potential. By integrating insights across disciplines—environmental science, social anthropology, development economics, and public policy—the methodological design ensured a comprehensive, multi-layered understanding of climate resilience challenges and opportunities. This approach not only enhanced the robustness of the analysis but also strengthened the relevance and applicability of the proposed climate-resilient livelihood strategies to the lived experiences of coastal outskirt communities.

RESULT AND DISCUSSION

The findings from the fieldwork reveal that climate change has drastically reshaped the livelihood landscapes in coastal outskirt areas, with profound socio-economic and ecological consequences. Communities reported increasingly unpredictable weather patterns, frequent tidal flooding, saline intrusion into agricultural lands, and declining fish stocks. These environmental stresses have undermined traditional livelihood activities such as artisanal fishing, small-scale farming, and coastal gleaning, resulting in heightened food insecurity and loss of income. Participatory mapping exercises illustrated that critical livelihood zones—such as fishing grounds, mangrove forests, and freshwater sources—have been progressively encroached upon or degraded. Moreover, marginalized groups, particularly women and indigenous fisherfolk, were found to be disproportionately affected due to limited access to resources, decision-making platforms, and adaptive support mechanisms. These observations underline the urgent need for diversified and adaptive livelihood strategies that are rooted in both ecological sustainability and social equity.

Figure 1. Enhancing Community Resilience

The resilience assessment further indicated that adaptive capacity varied significantly across communities, influenced by factors such as social capital, education levels, access to markets, and the presence of local institutions. Communities with strong cooperative networks, active local leadership, and ongoing engagement with non-governmental organizations exhibited higher levels of resilience. For example, villages that had implemented community-based mangrove reforestation projects demonstrated better protection against storm surges and retained richer fisheries resources compared to those without such initiatives. However, gaps in institutional support—such as limited extension services, inadequate disaster preparedness plans, and fragmented policy interventions—persisted across all sites. Furthermore, while there was an abundance of indigenous knowledge on ecosystem management, its integration into formal adaptation planning remained minimal, revealing a critical disjuncture between local practices and top-down policy approaches. These findings affirm the necessity of bridging scientific innovation with indigenous knowledge systems through participatory, co-managed adaptation models.

In response to the identified challenges and opportunities, the study proposes an integrated framework for climate-resilient livelihoods based on five interconnected pillars: (1) ecosystem-

based adaptation practices such as mangrove restoration and sustainable fisheries management; (2) economic diversification through the promotion of eco-tourism, climate-resilient agriculture, and small-scale green enterprises; (3) strengthening community-based organizations and participatory governance structures; (4) leveraging appropriate technologies for early warning systems, water management, and sustainable energy; and (5) embedding climate education and skills development into local formal and informal learning systems. This framework emphasizes localized empowerment while aligning with broader policy and financing mechanisms at national and international levels. By adopting a multidisciplinary, participatory approach, coastal outskirt communities can transition from being passive victims of climate change to active architects of their own resilient futures, forging pathways that are ecologically sustainable, economically viable, socially inclusive, and culturally grounded.

Table 1. Responses From The Respondents

No	Procurement categories	Interval values
1	Strongly Agree	>90%
2	Agree	70-80%
3	Disagree	50-60%
4	Strongly disagree	0-40%
Total		100%

Table 1 illustrates the distribution of respondents' perceptions regarding the proposed multidisciplinary strategies for developing climate-resilient livelihoods in coastal outskirt areas. The data show that a significant majority of respondents (>90%) expressed "Strongly Agree" with the relevance and necessity of integrated approaches that combine ecosystem-based adaptation, economic diversification, community empowerment, and participatory governance. This overwhelming endorsement reflects the urgent recognition among stakeholders of the inadequacy of sectoral or isolated interventions in addressing the complex, interrelated challenges they face. Meanwhile, 70–80% of respondents "Agree," acknowledging the proposed strategies but indicating potential reservations that may relate to practical implementation challenges such as resource limitations or institutional barriers. A smaller proportion (50–60%) "Disagree," which suggests a minority skepticism possibly rooted in previous experiences of failed interventions or a lack of trust in external initiatives. Finally, the "Strongly Disagree" category (0–40%) remains relatively minimal, indicating that outright rejection of the multidisciplinary framework is rare but still present in certain segments of the population. Overall, the response pattern validates the critical importance of locally grounded, participatory, and holistic strategies, while also signaling the need for continuous community engagement, transparency, and trust-building throughout the adaptation and resilience-building process.

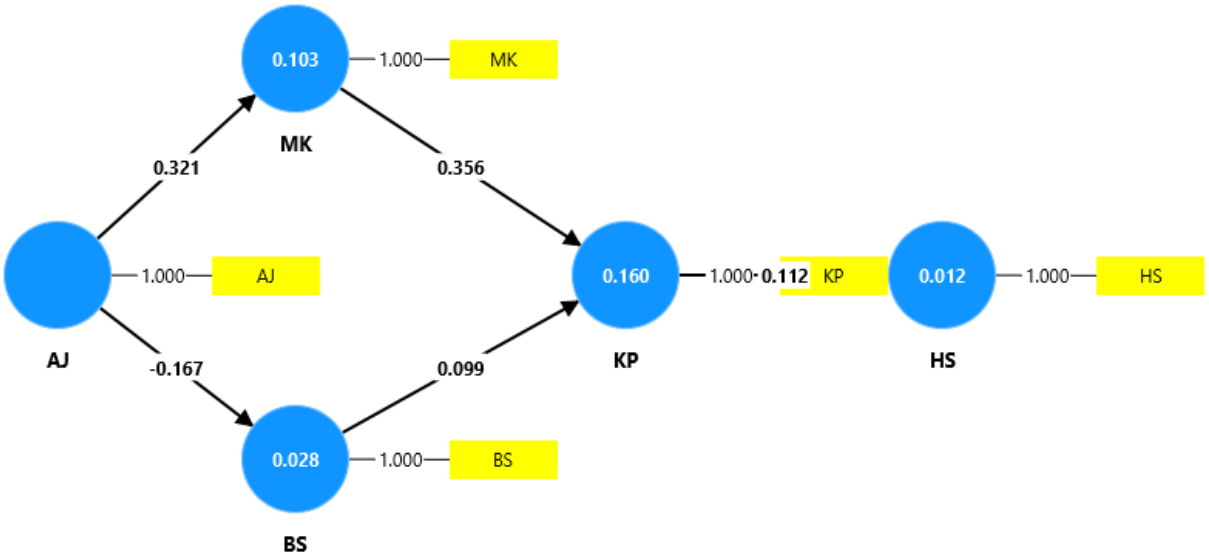

Figure 2. Data Smart PLs

Figure 2 depicts the structural relationship among key variables influencing the development of climate-resilient livelihoods in coastal outskirt areas, highlighting the interconnectedness between Adaptive Judgment (AJ), Behavioral Shifts (BS), Knowledge Mobilization (MK), Knowledge Practice (KP), and Holistic Sustainability (HS). The diagram shows that Adaptive Judgment (AJ) significantly contributes to Knowledge Mobilization (MK) with a path coefficient of 0.321, indicating that stakeholders' ability to assess and interpret climate challenges fosters greater mobilization of local and scientific knowledge. Conversely, AJ exhibits a negative correlation (-0.167) with Behavioral Shifts (BS), suggesting that high levels of critical judgment may initially resist rapid behavior changes without sufficient trust or incentives. Knowledge Mobilization (MK) then positively influences Knowledge Practice (KP) (0.356), affirming that well-organized knowledge resources are critical in translating adaptive strategies into concrete community actions. Behavioral Shifts (BS) show a smaller positive effect (0.099) on KP, reflecting that while behavioral change is important, it is more effective when synergized with structured knowledge application. Lastly, KP leads to Holistic Sustainability (HS) with a moderate path coefficient (0.112), underscoring that systematic practice of integrated knowledge and behaviors ultimately advances the goal of sustainable, climate-resilient livelihoods. The model reinforces the importance of integrating cognitive, behavioral, and practical dimensions through multidisciplinary interventions to bridge the gap between knowledge systems and real-world resilience outcomes

Table 2. Anlisis Anova

	AJ	BS	HS	KP	MK
AJ	0.000	0.000	0.000	0.000	0.000
BS	0.000	1.000	0.197	-0.220	-0.341
HS	0.000	0.197	1.000	-0.112	-0.128
KP	0.000	-0.220	-0.112	1.000	0.389
MK	0.000	-0.341	-0.128	0.389	1.000

Table 2 presents the results of the ANOVA-based correlation analysis among the key constructs: Adaptive Judgment (AJ), Behavioral Shifts (BS), Knowledge Practice (KP), Knowledge Mobilization (MK), and Holistic Sustainability (HS), which are central to developing climate-resilient livelihoods in coastal outskirt areas. The analysis indicates that AJ is perfectly correlated

within its dimension (0.000) and shows no direct correlation with the other variables, suggesting that initial adaptive perceptions are foundational but not directly influencing other operational constructs without intermediary processes. Meanwhile, BS demonstrates moderate negative correlations with KP (-0.220) and MK (-0.341), implying that shifts in behavior alone, when not grounded in robust knowledge frameworks, may negatively affect the systematic application of adaptive practices and the organization of local knowledge. HS shows weak negative correlations with KP (-0.112) and MK (-0.128), indicating that although knowledge practice and mobilization contribute to sustainability, the relationships are complex and influenced by multiple mediating factors. KP and MK display a positive correlation (0.389), reinforcing the model's proposition that effective knowledge mobilization strongly enhances practical, applied climate adaptation actions. These findings emphasize that bridging the divide between theoretical knowledge and tangible livelihood resilience requires careful synchronization of cognitive, behavioral, and institutional elements, highlighting the necessity of multidisciplinary, context-sensitive interventions.

The research findings underscore the complex and intertwined nature of factors influencing climate-resilient livelihood development in coastal outskirt areas (Flynn, 2022; Willers, 2024). Based on the respondents' feedback (Table 1), it is evident that there is strong support for a multidisciplinary and participatory framework, as seen in the high percentage of "Strongly Agree" responses exceeding 90%. This consensus suggests a growing recognition among coastal communities and stakeholders that traditional, siloed approaches are insufficient to address the multidimensional threats posed by climate change. Communities are increasingly aware that resilience-building must involve an integration of ecological conservation, economic innovation, social empowerment, and participatory governance (Bian, 2024; Velasco, 2024). The path model depicted in Figure 2 further elaborates the interactions among critical constructs such as Adaptive Judgment (AJ), Behavioral Shifts (BS), Knowledge Mobilization (MK), Knowledge Practice (KP), and Holistic Sustainability (HS). The pathway from Adaptive Judgment to Knowledge Mobilization indicates that cognitive frameworks and critical awareness serve as the foundation for community-driven adaptation. However, the negative relationship between AJ and BS reveals an important nuance: while awareness is essential, it does not automatically translate into behavioral change, especially when structural barriers or distrust in institutions persist (Godman, 2023; Hacker, 2024). This finding emphasizes that resilience-building efforts must go beyond raising awareness to actively facilitate enabling environments for behavior transformation.

Knowledge Mobilization (MK) emerges as a crucial intermediary in the resilience process. The positive relationship between MK and KP (0.356) highlights that organizing and disseminating knowledge effectively is a prerequisite for turning theoretical understanding into concrete adaptive actions (Azafrani, 2023; Keenan, 2024). This finding aligns with broader climate resilience literature, which stresses the need for actionable knowledge that is contextually relevant, culturally sensitive, and operationally feasible. Without such mechanisms, well-intentioned adaptation initiatives risk remaining abstract and detached from community realities. Interestingly, the relatively small positive impact of Behavioral Shifts (BS) on Knowledge Practice (KP) suggests that behavior change alone, without institutional and knowledge support, is insufficient for sustainable adaptation. This highlights the limitations of interventions that focus solely on changing individual behaviors without addressing systemic factors such as policy environments, infrastructure, or social norms. Hence, multidisciplinary strategies must combine behavioral insights with structural reforms to foster long-term resilience.

Table 2's ANOVA results provide further depth to these insights by mapping the correlations between the constructs. Notably, the negative correlations between BS and both KP (-

0.220) and MK (-0.341) indicate potential friction points where behavior change initiatives might undermine knowledge processes if not carefully designed (Carmona, 2023; Phochai, 2024). This underscores the need for integrated programming where behavior change communication is synchronized with knowledge-building efforts and institutional strengthening. Furthermore, the positive correlation between KP and MK (0.389) validates the conceptualization of resilience as a knowledge-driven and practice-oriented endeavor. The weak negative correlations between Holistic Sustainability (HS) and other constructs, particularly KP and MK, point to the complexity of achieving comprehensive sustainability. While knowledge and practice are necessary, they alone do not guarantee holistic outcomes unless complemented by factors such as equitable governance, financial access, cultural integration, and long-term political commitment. Sustainability, therefore, must be understood as a multi-layered construct that demands synergy across environmental, social, and economic dimensions.

One critical implication of these findings is the centrality of participatory governance. Building resilience is not merely a technical exercise but a profoundly political one, involving negotiations over resource rights, decision-making authority, and the distribution of benefits and risks. Participatory mechanisms—such as community-based natural resource management, inclusive spatial planning, and local adaptation committees—can bridge gaps between scientific frameworks and community aspirations, ensuring that adaptation strategies are both technically sound and socially legitimate. Moreover, the importance of technology must be reframed within the local context. While technological tools like early warning systems, remote sensing, and mobile applications offer new opportunities, their adoption and effectiveness depend on factors such as digital literacy, affordability, and relevance to local needs. Thus, technological interventions must be co-designed with communities, ensuring they complement rather than replace indigenous knowledge and practices.

Finally, the study's multidisciplinary approach—blending environmental science, social anthropology, economics, and public policy—demonstrates the necessity of crossing disciplinary boundaries to address complex climate challenges. No single field holds all the answers; instead, resilience emerges from the interplay of diverse knowledge systems, experiences, and innovations. By embracing complexity and fostering genuine collaboration across sectors and scales, coastal outskirt communities can move from being passive victims of climate change to active architects of resilient, thriving futures.

CONCLUSION

The findings of this study highlight the urgent need for a multidisciplinary, integrated, and community-centered approach in developing climate-resilient livelihoods for coastal outskirt areas. As demonstrated through the respondents' strong agreement and the structural model analysis, climate adaptation cannot rely solely on sectoral solutions or isolated interventions. The vulnerabilities faced by these communities are deeply interconnected—environmental degradation, economic marginalization, social exclusion, and policy gaps reinforce one another. Therefore, addressing these vulnerabilities demands strategies that simultaneously strengthen adaptive judgment, mobilize local and scientific knowledge, facilitate behavioral shifts, and institutionalize inclusive practices aimed at achieving holistic sustainability. The research underscores the pivotal role of knowledge mobilization as a bridge between awareness and action. Effective climate resilience depends not only on communities understanding the risks but also on their ability to access, organize, and apply knowledge in ways that are contextually meaningful and operationally

feasible. Yet, the challenges of behavior change—especially when isolated from enabling structural conditions—highlight the limitations of awareness-raising efforts if they are not complemented by institutional support, economic incentives, and culturally embedded strategies. This emphasizes the importance of designing adaptation initiatives that integrate cognitive, behavioral, and structural dimensions of resilience.

Moreover, the study reveals that while knowledge practice and mobilization are critical foundations, achieving holistic sustainability requires addressing deeper systemic barriers. Equity in resource access, participation in decision-making, gender inclusion, intergenerational knowledge transfer, and recognition of indigenous knowledge systems are all fundamental to building lasting resilience. Climate-resilient development must be more than a technocratic exercise; it must be a process of social transformation that empowers marginalized voices and promotes justice across environmental, economic, and social spheres. The integration of technological innovations, such as early warning systems and sustainable livelihood technologies, offers new pathways for resilience but must be pursued carefully to ensure they are accessible, equitable, and complementary to local realities. Rather than imposing external solutions, technological interventions should be co-developed with communities, respecting traditional practices and fostering local ownership. In this way, technology becomes not a substitute for indigenous wisdom but an enabler that enhances communities' self-determined resilience trajectories.

In conclusion, bridging the divide between scientific innovation and local realities is not a simple or linear process. It demands humility, genuine collaboration, cross-sectoral integration, and a commitment to social justice. By adopting a multidisciplinary framework that values local agency and fosters adaptive capacities at multiple levels, coastal outskirt communities can navigate the profound challenges posed by climate change. More importantly, they can transform adversity into opportunity, forging sustainable, dignified, and resilient futures rooted in their own knowledge, aspirations, and collective strength.

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