



BEYOND VOLATILITY: HARNESSING VUCA METHODOLOGY FOR SUSTAINABLE COLLABORATION IN BINTAN ISLAND'S MANGROVE ECOTOURISM GOVERNANCE

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Abstract

Collaborative Governance has emerged as a critical strategy for achieving public goals through collaboration with diverse organizations and individuals. The policy process requires the participation of various public institutions, with stakeholders directly or indirectly involved in addressing societal problems. In developing countries such as Indonesia, the power of stakeholders in implementing existing programs is critical to the success of collaborative governance. Indonesia has adopted an ecotourism strategy emphasizing sustainable practices, while the tourism industry emphasizes environmental preservation. Bintan Island is an attractive location for ecotourism activities due to its many prospective tourist destinations, ranging from land to sea, including mangrove forests in the coastal area. Due to its proximity to the Indonesia-Singapore-Malaysia border, the island has tremendous economic value for the local community. However, our research shows that the current situation regarding stakeholder participation in collaborative governance shows a weak correlation between actors. Significant gaps in collaborative governance dimensions and indicators must be addressed during the VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) period. In particular, many stakeholders lack the knowledge and understanding to engage interested parties and foster positive social interactions. To address this shortcoming, we propose to adopt the VUCA methodology as an alternative evaluation method for collaborative stakeholder-based governance. By doing so, we can integrate a more dynamic and adaptable framework to better adapt to rapidly changing socio-economic conditions.

Keywords

Stakeholders, Collaborative Governance, VUCA Approach, Bintan Island, Collaboration

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I. Introduction

Indonesia's mangrove ecosystems cover 20 per cent, or 3.49 million hectares, of the total mangrove area on the planet (Kusmana, 2011; Mursyid et al., 2021; Sidik et al., 2023). Mangroves provide essential ecological benefits to the coastal communities of Indonesia, including erosion prevention, cyclone resistance, pollutant filtration, and marine life habitat. (Sidik et al., 2018). They offer tourism, timber, and non-timber materials as a sustainable source of income (Soegiarto, 1984). In addition, mangroves can substantially mitigate climate change by sequestering carbon (DasGupta and Shaw, 2013; Datta et al., 2012; Wilkinson et al., 2006) (Fitzgerald and Publisher, 2000).

Implementing regulations and policies demonstrates the government's commitment to managing the mangrove ecosystem of Environment and Forestry Regulation No. p.105/menlhk/sekjen/kum.1/12/2018 and the coordinating minister for the Economy Regulation No. 4 of 2017 were enacted to support and guide the rehabilitation of the forest and land and to manage the national mangrove ecosystem, respectively (Wahyudi and Adi, 2018; Rizal, 2018). Ecotourism management in mangrove ecosystems has been introduced as a paradigm incorporating ecological, economic, social, technological, and ethical dimensions to promote responsible tourism practices and environmental preservation (Alfiandri et al., 2021; Parmawati et al., 2018).

In addition, research conducted on Bintan Island has revealed that stakeholders perceive the tourism industry as the only entity capable of controlling the development of coastal mangrove areas for ecotourism purposes without the involvement of the local community. This emphasises the significance of involving the private sector in developing ecotourism-based innovative and sustainable tourism activities along the coastal areas of Bintan Island. To realise sustainable ecotourism development in the coastal areas of Bintan Island, stakeholder participation and collaborative governance are crucial. Collaborative governance necessitates the involvement of all stakeholders in the decision-making procedure to determine their respective interests, requirements, and expectations (Ansell and Gash, 2008; Emerson et al., 2012; Purdy, 2012; Silvia, 2011; Zadek, 2008). Effective mapping and engagement of stakeholders can ensure that all pertinent data and perspectives are considered (Hovardas, 2021; Robertson and Choi, 2012).

Several nations, such as Mexico and the Philippines, have successfully implemented community-based ecotourism initiatives and partnerships to preserve mangroves and stimulate local economies. These exemplary models could inform the Indonesian government on critical success factors and best practices for stakeholder engagement. However, attaining collaborative governance in mangrove ecotourism initiatives has proven difficult in several countries, such as Vietnam and Sri Lanka, as studies have shown a range of outcomes for stakeholder participation (Tran et al., 2019; Wijesinghe et al., 2020). In contrast, Mexico and the Philippines have experienced positive impacts on mangrove conservation and local economies due to the involvement of numerous stakeholders, including local communities, governments, and non-governmental organisations. (Alfaro-Nez et al., 2019; Bolivar et al., 2018). A barrier to effective collaborative governance on Bintan Island in Indonesia has been identified as an ineffectual collaboration between stakeholders. During the VUCA era, significant disparities in collaborative governance dimensions and indicators have

emerged. (Akbar and Ikhsan, 2019). The VUCA methodology, an alternative evaluation technique for collaborative stakeholder-based governance, has been proposed to address these obstacles. VUCA is a dynamic and adaptable framework that facilitates adaptation to rapidly shifting socioeconomic conditions by emphasising preparedness for planning and implementation (Gao et al., 2021; Nandram and Bindlish, 2017). In the end, effective stakeholder participation, adaptive governance strategies, and the incorporation of best practices from other nations are necessary to achieve successful collaborative governance in mangrove e Ecotourism on Bintan Island's Coastal Area.

This study aims to elucidate the current landscape of stakeholder participation within the domain of collaborative governance, where preliminary findings suggest a tenuous correlation among participatory actors. It highlights substantial disparities across various dimensions and indicators of collaborative governance that necessitate immediate attention in a VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) environment. A critical observation is that numerous stakeholders are bereft of the requisite knowledge and comprehension to engage interested entities to foster beneficial social interactions.

Drawing inspiration from successful models across the globe, including nations like Mexico and the Philippines, where community-based initiatives have flourished, our gaze extends beyond borders. While these examples offer valuable insights, our vision stretches further, encompassing the European Union (EU) as a key partner in the pursuit of sustainable development. The EU, with its steadfast commitment to environmental sustainability and collaborative governance, finds resonance in the ethos of Bintan's mangrove conservation efforts.

II. Literature Review

Ecotourism on Bintan Island's Coastal Area

The case study of Coastal Ecotourism on Bintan Island emphasizes the significance of adhering to the ecotourism principles that emphasize conservation, community, and sustainable tourism. There is a conflict between the benefits of tourism and the negative impacts it causes in coastal tourism. Coastal tourism must be incorporated into strategic planning to reduce harmful effects and maintain sustainability.

Developing mangrove ecotourism is one method to increase mangrove forest productivity without destroying the ecosystem's balance. Integrated Coastal Zone Management (ICZM) principles can contribute to the sustainability of coastal tourism (Marzetti et al., 2016; Milanés Batista et al., 2020). ICZM requires ecosystem and holistic approaches, effective governance, intergenerational and intragenerational solidarity, preservation of distinctiveness, and prevention principles (Gerhartz-Abraham et al., 2016; O'Mahony et al., 2020; Rochette and Billé, 2012).

Many nations have implemented Integrated Coastal Zone Management (ICZM) to attain sustainable coastal development. ICZM implementation varies from country to country based on their distinct social, economic, and environmental circumstances. In Australia, for instance, the national strategy for ecologically sustainable development incorporates ICZM principles that promote community participation in decision-making processes (Australian Government, 2019). The Coastal Zone Management Act of 1972 in the United

States provides funding and guidelines for state and local governments to develop and implement ICZM plans. (NOAA, 2021). In the meantime, the European Union supports ICZM initiatives through funding programs such as the European Regional Development Fund and has developed ICZM-promoting policies and directives. (European Commission, 2014).

The government has established an Integrated Coastal Zone Management program in Indonesia that prioritizes community empowerment and participation, environmental protection, and economic growth (Irianto et al., 2018). Similarly, South Africa's National Coastal Management Program emphasizes stakeholder participation, community-based management, and integrated planning. (South African Government, 2014). These examples illustrate how various nations have implemented ICZM principles and strategies to accomplish sustainable coastal development while considering their particular circumstances.

Implementing integrated coastal zone management (ICZM) has been crucial to attaining sustainable global coastal development. As there is no universal formula for ICZM implementation, various nations have employed a variety of approaches. For the program's success, it is essential to consider the local context and involve stakeholders in decision-making processes.

Local governments on Bintan Island have established policies to preserve mangrove forests. However, more attention is required to develop and administer the Mangrove ecotourism area to positive and negative effects. Stakeholders must participate once in activities that align with the regional vision and mission. Implementing ecotourism principles and ICZM can contribute to the sustainability of coastal tourism, preserve environmental and cultural awareness, and provide economic benefits for local communities. For the long-term sustainability and conservation of Indonesia's mangrove ecosystems, this strategy necessitates the participation of all stakeholders in the decision-making process and the implementation of adaptable frameworks, such as the VUCA method.

Collaborative Governance and Ecotourism

The field of sustainable ecotourism has acknowledged the crucial importance of collaborative governance, as Mulyani et al. (2021) emphasized in their research on Magelang Regency, Central Java, Indonesia. This study offers essential insights into how cooperative endeavors between government, commercial sectors, and local communities may propel the advancement of sustainable ecotourism. Comparing these findings with similar research carried out in different geographical and geopolitical settings is advantageous for a more comprehensive understanding. Rahmat et al. (2023) explain how research on water-based tourism has increased rapidly in the last few decades.

The study conducted by Charlie et al. (2021) explores the environmental governance networks in small island destinations in Indonesia and the Coral Triangle region. Their research confirms the need for a governance framework that involves multiple stakeholders working together, emphasizing how crucial it is to promote ecotourism's sustainable growth. This aligns with Mulyani et al.'s findings and underscores these governance models' broad applicability in many environmental and cultural contexts.

In addition, Sentanu et al. (2023) conducted a comprehensive analysis that identified crucial elements for achieving success, such as active involvement of stakeholders, a shared vision, and efficient communication. They also highlighted obstacles such as power imbalances and lack of confidence among stakeholders in collaborative governance structures. Bichler and Lösch (2019) provide empirical observations on the involvement of local inhabitants in regulating tourism. Their study emphasizes the need for inclusive decision-making procedures, recognizing community concerns, and advancing the discussion on fair stakeholder participation.

These comparative analyses reveal that collaborative governance is essential for the sustainable development of ecotourism. Successful implementation relies on the complex cooperation among government bodies, the business sector, and local populations. These studies emphasize the importance of addressing common obstacles such as unequal power dynamics, lack of trust, and failures in communication. Furthermore, they support governance models that encourage inclusivity, common goals, and equitable distribution of benefits among all participants. Therefore, strengthening collaborative governance in ecotourism requires a comprehensive strategy for including stakeholders and a firm dedication to tackling structural obstacles and promoting a culture of trust and mutual respect. The combined knowledge acquired from this research provides a detailed plan for future efforts in the worldwide development of sustainable ecotourism.

Collaborative Governance as a Research Framework

Collaborative governance involves multiple stakeholders collaborating to address complex public problems through joint decision-making and shared responsibility (Ansell and Gash, 2008). This approach involves government officials and representatives of different interest groups, including non-governmental organizations, community members, and other stakeholders (Liu et al., 2020). This strategy includes government officials and representatives of various interest groups, such as non-governmental organizations, community members, and other stakeholders (Ansell and Gash, 2008; Baird and Plummer, 2015; Fisher et al., 2020; Liu et al., n.d.; Lockwood et al., 2010; Qi, 2019; Ran and Qi, 2019; Silvia, 2011; Zadek, 2008).

In ecotourism management or mangrove conservation, collaborative governance can ensure that all relevant stakeholders have a voice in decision-making and that their interests are considered. In the administration of ecotourism sites, for instance, collaboration among diverse stakeholders can help to strike a balance between the economic benefits of tourism, environmental protection, and the needs of local communities (Dredge and Jenkins, 2007). Similarly, collaborative governance can facilitate the sustainable management of mangroves by involving stakeholders in the planning and executing of conservation initiatives. (Primavera and Esteban, 2008). By involving local communities in decision-making, these initiatives can promote more efficient and equitable use of resources and increase support for conservation efforts (Qiu et al., 2021; Sattayapanich et al., 2022).

This study's research framework is a three-level strategy founded on the theoretical framework of collaborative governance (Ansell and Gash, 2008). The methodology includes

stakeholder mapping analysis (Friedman and Miles, 2002), participatory processes (Eisenhower, 1965), and VUCA analytical approaches. (Nandram and Bindlish, 2017). Ansell and Gash propose a framework for Collaborative Governance that distinguishes collaborative self-processing from external drivers influencing success or failure, such as facilitator leadership, initial conditions, and institutional design.

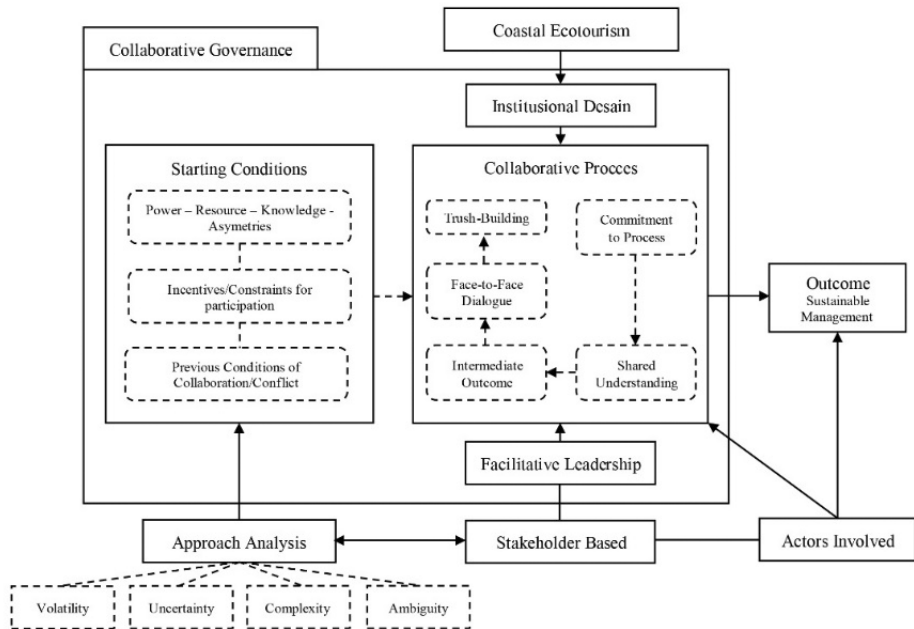
Due to the dynamic, uncertain, and complex nature of the global environment, the VUCA analytical framework is essential. In 2016, the World Economic Forum identified ten talents necessary for a super-smart society, with problem-solving, critical thinking, and creativity ranking highest. This demonstrates the importance of knowledge and a method of thinking that can adapt to ever-changing circumstances. Using the Collaborative Governance framework, the researcher describes the relationship between stakeholders and actors involved in developing Ecotourism along the coastline of Bintan Island (Irman and Akbar, 2021), including potential stakeholders for leadership facilitation of the VUCA analytical approach. The participation of actors facilitates the collaborative process via interviews, face-to-face dialogues, and the development of trust, commitment, and mutual understanding of Collaborative Governance. (Kelliher et al., 2014; Nieto et al., 2015).

To develop ecotourism in Bintan Island's mangrove ecosystems, it is necessary to incorporate multidisciplinary approaches and strengthen the foundation of the VUCA approach. Stakeholders must adapt and prepare for the change in response to VUCA challenges, while the Collaborative Governance framework provides a foundation for attaining shared objectives despite uncertainty. For successful Collaborative Governance in ecotourism management, it is necessary to strengthen performance management, restructure the institutional organization, develop e-government, and enhance stakeholder transparency. The effect of VUCA will be observed in improving stakeholders' critical thinking, creative problem-solving, communication, and collaboration skills.

According to Ansell and Gash's definition of Collaborative Governance, there are two crucial variables: collaboration processes and collaboration-influencing factors. In non-ideal conditions, such as the current COVID-19 pandemic, a VUCA analysis approach is required to resolve deficiencies in the initial condition indicators and the influencing factors in the collaboration process. By bolstering the foundation of the VUCA approach, the core principles of Collaborative Governance can be applied to the development of mangrove ecotourism on Bintan Island (see Figure 1).

Existing uncertainty demonstrates that VUCA is an unavoidable circumstance that must be confronted if Collaborative Governance is to endure managing Mangrove ecotourism on Bintan Island. The characteristics of VUCA that are most relevant to the current situation are the preparedness of stakeholders and the urgency of initiating the Collaborative Governance process to resolve the current issue.

Stakeholders on Bintan Island have a positive outlook on preparation and entering a state of readiness regarding government/public and private/personal responsibilities, and they are supportive. Each Stakeholder actor must be adaptable due to the challenges and opportunities presented by change. In a VUCA world, it is ambiguous which direction to pursue, making innovation development increasingly difficult for stakeholders.

Figure 1: Research framework

Source: Modified by researcher, 2022

Managing mangrove ecotourism in the coastal area of Bintan Island requires strengthening performance management in the public sector, restructuring government organizations, developing e-government, enhancing human resource management in the public sector, improving the quality of public services, and providing stakeholders with transparency. In the future, VUCA will impact the abilities of Stakeholder actors in critical thinking, inventive and innovative problem-solving, communication, and collaboration. Thus, implementing good Collaborative Governance is possible and will positively impact all stakeholders in managing Mangrove ecotourism on Bintan Island.

III. Research Method

We employed qualitative research methods to investigate collaborative governance in Mangrove ecotourism (Bennett and Elman, 2006; Renz et al., 2018; Tellis, 1997; Yazan and De Vasconcelos, 2016). Interviews were used to acquire primary and secondary data. Descriptive analysis techniques were used to examine the socially constructed nature of reality and the relationship between the researcher and the subject of study. Using tools such as Tree Maps, Cluster Analysis, and Charts, the authors managed, integrated, and searched for patterns and relationships in their data using NVivo 12 Pro software (Auld et al., 2007; Nurlaela Arief et al., 2022).

This investigation's qualitative data analysis activities included data reduction, data display, and withdrawal/verification of conclusions. In addition, triangulation analysis was utilized to determine the veracity of certain information using multiple data collection techniques and sources. Based on stakeholder mapping, the study employed a qualitative approach with case studies to discover, describe, analyze, project, and give meaning to Mangrove ecotourism on Bintan Island. The authors' objective was to comprehensively comprehend collaborative governance in Mangrove ecotourism that can inform future policies and management practices. The study's theoretical foundation assisted the authors in understanding the topic's context and provided material for discussing the findings.

VUCA Approach

VUCA has become a commonly used acronym in management and decision-making to describe organizations' challenges in today's complex and uncertain environment. VUCA comprises four components: volatility, uncertainty, complexity, and ambiguity (Jacquier et al., 2012; Kline, 1985; Siau and Cao, 2001; Frisch and Baron, 1988).

Volatility refers to unpredictable and unstable situations; however, information is accessible as events transpire. Uncertainty results from the absence of crucial information required for follow-up, such as time, duration, cause and effect, and strategies to minimize losses resulting from the delay. Complexity entails dealing with vast quantities of interconnected, dynamic information, components, and relationships. Ambiguity is characterized by a lack of information and precedent, which makes it difficult to predict the effects of actions and minimize their influence on future outcomes (Jacquier et al., 2012; Kline, 1985; Siau and Cao, 2001; Frisch and Baron, 1988). These circumstances can sometimes confuse or improve decision-makers' capacity to see the big picture and plan accordingly. VUCA provides a framework for managing and leading organizations during emergencies and other complex situations to resolve these challenges. Organizations can navigate their environments and achieve their objectives more effectively by preparing a work agenda accommodating volatility, uncertainty, complexity, and ambiguity. (Bennett and Lemoine, 2014).

Table 1 highlights the crucial significance of VUCA in decision-making, risk management, change management, and problem-solving. VUCA is an acronym that describes our ever-changing world's volatility, uncertainty, complexity, and ambiguity. It profoundly impacts an organization's capacity to adapt and thrive in such an environment. Essentially, VUCA serves as a valuable code of practice for awareness and preparedness. It encompasses vast knowledge concerning learning models for VUCA readiness, anticipation, evolution, and intervention (Satish, 2006). Therefore, by understanding and implementing VUCA principles, organizations can enhance their ability to anticipate and address challenges proactively while leveraging opportunities effectively.

Table 1: The Relationship of VUCA to Organisational Context and the Individual in Its Development. Source: Processed by Us, 2021

V	U	C	A
* Practice role elasticity and develop a “generalization specialist”. * Increase decision speed * Build in the system and build slack in the supply chain * Utilize alternative technologies and strategies to ensure continuous communication * Regularly train to withstand various disturbances and improve skills, knowledge, and talents * Utilize high potential for temporary tasks	* Gather additional information and insights, including customer data * Improve access to market insights through the latest technology * Reflect and share experiences of successfully dealing with uncertainty * Identify the causes of the current situation and focus on what is within your range of control * Identify interests and strengths to keep you engaged * Implement agile performance appraisals and provide regular feedback	* Improve communication, collaboration, and coordination * Clarify decision-rights * Adapt organizational structure and expertise to suit the complexity of the context * Identify people who have strength and experience in dealing with complexities * Recruit and develop people who can thrive in complexity	* Create (some) clarity. Make room for interaction * Re-engage and recommit to goals * Understand and prioritize user needs * Practice making quick program innovations to fail faster and learn faster * Experiment and experiment to discover the unknown * Take the time to learn the lessons from experience and pass on them

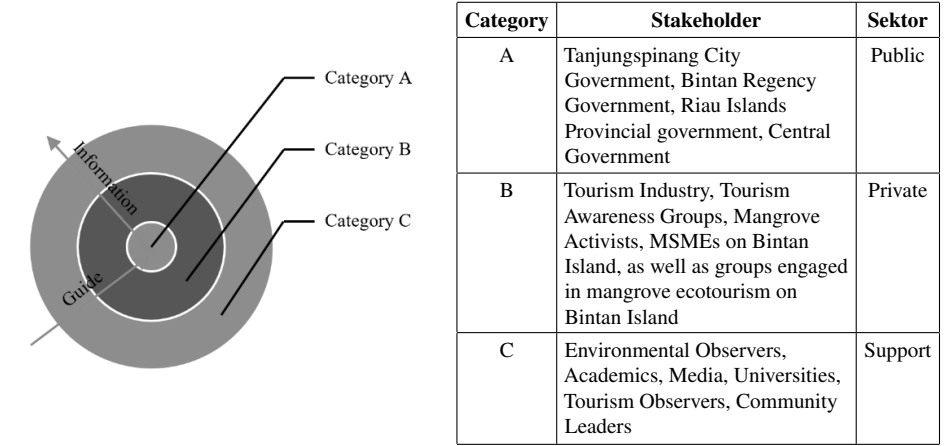
Source: Own proceedings

Stakeholder Based

Stakeholders refer to individuals or groups outside an organization who are interested in and can influence the organization's performance (Hill and Jones, 1992). Since each stakeholder has unique needs, it is crucial to perform accurate stakeholder mapping tailored to suit the organization's particular requirements (Derakhshan et al., 2019). Successful mapping bears fruit as it results in critical information for policy formulation and improved relations with stakeholders while implementing programs that benefit the community (Nieto et al., 2015). Additional relevant stakeholders can be included during the initial participatory meeting to facilitate this process, which supplements the grouping classification (Jones, 1945). A stakeholder engagement approach in the form of mapping

can guide the participation process, as it limits the number of groups but not their influence (Freeman et al., 2010). The figure and table below display the groupings resulting from this approach.

Figure 2: The circle of influence of the participatory process in stakeholder-based classification on Collaborative Governance during the VUCA era



Source: Own proceedings

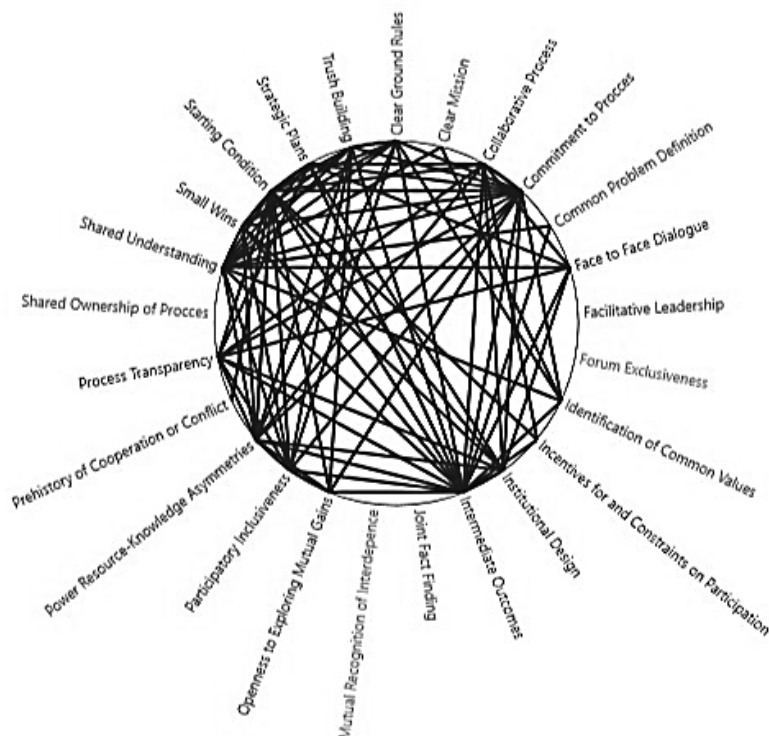
Internal and external publics are intimately connected to stakeholder aggregation. Internal stakeholders are those associated with the activities of organizations or government agencies. In contrast, external stakeholders engage in public activities outside the agency and provide information to foster improved relationships. (Srinivasan and Dhivya, 2020). Stakeholder analysis is divided into three categories: (i) productive sectors such as community activities in mangrove-based ecotourism, nature tourism groups, the Mangrove industry, or actors directly involved in the implementation of Mangrove ecotourism on Bintan Island; (ii) state institutions with expertise in their respective fields; and (iii) academics, social and non-governmental organizations, as well as contributions from the people of Bintan Island.

As depicted in the preceding figure, this group primarily supports decision-making processes, leads collaborative stakeholder discussions on broad challenges, and validates interview results (Irvin and Stansbury, 2004). Through implemented programs and program evaluations, the results provide insights and feedback on critical issues related to mangrove ecotourism research on Bintan Island. Participation is necessary for this group to provide pertinent information and knowledge regarding mangrove management. In the littoral region of Bintan Island, stakeholder mapping discusses the collaborative government aspect of mangrove ecotourism. In this situation, stakeholders have a collaborative relationship with the government, which prepares them for the unpredictability of the VUCA era.

IV. Result

Collaborative Governance Analysis That Influences It

Figure 3: The Effect of Collaborative Governance on Coastal Ecotourism in Bintan Island



Source: NVivo processing, 2021

Sectoral Ego and Stakeholder Collaboration

The NVivo investigation reveals that a significant ‘sectoral ego’ obstacle hinders stakeholder collaboration. Sectoral ego, which denotes the tendency to prioritize individual or departmental interests above group objectives, results in a fragmented approach to governance. The dispersion of stakeholders’ agendas and conflicting interests hinders the development of a cohesive plan for mangrove ecotourism. The existence of sectoral ego indicates a more profound problem of distrust and a deficiency in comprehension among stakeholders regarding the reciprocal advantages of ecotourism growth.

Leadership and Shared Vision

The results indicate a significant lack of effective leadership facilitation and the formation of a shared vision among stakeholders. Efficient leadership is essential for guiding heterogeneous groups towards shared objectives. Within Bintan Island, the lack of a proactive leadership role has resulted in fragmented endeavors and a deficiency in collaboration among those involved. Furthermore, the lack of ability to build a shared vision for the growth of mangrove ecotourism worsens the situation, causing each participant to prioritize their interests without considering the overall benefit.

Evidence of Cooperation vs. Actual Collaboration

Although several informants may record instances of cooperation, it does not necessarily follow that there is genuine collaborative governance. The investigation uncovers a disparity between surface-level cooperation and the more profound, fully integrated collaboration necessary for ecotourism's sustainable development. This superficial collaboration frequently appears as short-term alliances or restricted involvements that do not tackle the fundamental obstacles of governance and do not fully exploit the combined strengths of stakeholders.

Implications for Mangrove Ecotourism Development

The absence of efficient cooperation and a common objective among everyone involved not only obstructs the progress of mangrove ecotourism but also presents substantial threats to the ecological soundness of Bintan Island's coastal areas. Without a cohesive strategy for ecotourism, there is a risk of overutilizing natural resources, deterioration of mangrove ecosystems, and declining biodiversity. Moreover, the lack of a unified system of governance reduces the economic advantages of ecotourism for local communities, as disjointed initiatives cannot optimize the tourist experience or guarantee long-term and sustainable sources of income.

Stakeholder Mapping Influencing It

Mapping stakeholders is a crucial first stage in formulating stakeholder relations policies. The results of stakeholder mapping provide the primary information required to formulate stakeholder relations policies. Policy formulation entails a series of data collection activities, such as discussions on criteria for determining stakeholder classification, data processing and analysis, strategy determination, formulation of various approaches, and program agendas that will be executed in collaboration with stakeholders.

Using the results of NVivo's data processing, we represent categories in columns and expressions in table data using Treemap levels. Interviews about collaborative governance in the development of mangrove-based ecotourism in coastal areas of Bintan Island led to the development of a stakeholder map. As depicted in Figure 4, the size represents the proportion of collaborative governance. The Maritime Affairs and Fisheries Service of the Riau Islands Province is advancing collaboration among stakeholders. The coastal area management area prioritizes cooperation to derive economic value from the coast's tourism

and environmental conservation sectors, especially in the Marine and Fisheries program area. Therefore, it is natural for stakeholders to dominate the Riau Islands Province Maritime and Fisheries Service, which has limited authority from 0 to 12 nautical miles offshore.

Figure 4: The Treemap identifies topics repeatedly raised by actors involved in coastal Eco-tourism on Bintan Island



Source: Own proceedings

The Planning and Training Agency for the Development of the Riau Islands Province dominates the second level. This indicates that the capacity of the Riau Islands Province's planning and research agency to support every ecotourism-based program that has become a priority, as well as the Governor's vision and mission to attract foreign tourists to Bintan Regency and Tanjungpinang City, both of which have the potential to become long-term mangrove destinations. However, despite the regional head's leadership in promoting this vision and mission, conditions are not producing the desired results. Many extant mangrove ecotourism programs are not managed effectively due to provincial, district, and municipal governments' lack of capacity. These governments assert that local community organizations and tourism industry administrators are responsible for accelerating ecotourism development in Bintan Island's coastal areas.

The third level addresses the role of academic studies in collaborative governance for developing mangrove ecotourism on Bintan. Multiple research findings and academic studies indicate that university participation in the development of mangrove ecotourism in coastal areas of Bintan Island is essential. Stakeholders from the private and public sectors and the local government must implement policies and recommendations issued

from high. Despite these findings, universities continue to play a minimal role, as each stakeholder can conduct independent research without participating in scientific processes or academic discussions.

The collaborative governance component must be bolstered to address these issues through inclusive discussion forums, such as the Penta-helix approach involving private academics, community media, and the mangrove ecotourism industry on Bintan Island, Indonesia. This is essential because the island of Bintan consists of three autonomous regions requiring sustainable collaboration or collaborative governance. Formally and informally, the relationship between stakeholder factors in strengthening ecotourism in coastal areas based on collaborative governance has become incapable of forming exclusive relationships. Programs that have been implemented or have not been implemented have had no significant impact on the livelihoods of Bintan Island’s coastal communities.

V. Discussion

Collaborative Governance in the VUCA Approach; Current Condition of Ecotourism on Bintan Island

Adaptation to volatility or instability is essential for making quick judgments. To ensure that flexibility in decision-making does not have a negative effect, it is necessary to examine each action thoroughly. Stability is required in collaborative governance to address population growth along the coast, leading to changes in land use and excessive use of natural resources, resulting in the rapid depletion and destruction of mangrove forests throughout the tropics. The lack of mangrove forests is a primary environmental and economic concern for developing nations, including Indonesia, particularly in the Bintan Island region.

Figure 5: Southeast Asian Maps and the Location of Bintan Island



Source: Google Maps

Figure 6: Bintan Island shares borders with Singapore and Malaysia



Source: Google Maps

Furthermore, trash in the ecotourism area of Mangroves on Bintan Island degrades the natural landscape and hinders the growth of Mangrove trees and seedlings. On Bintan Island, there is also a dearth of education regarding the significance of mangrove forests to the local population. In this regard, collaborative governance actors must focus on volatility to achieve objectives and solve problems in decision-making regarding the development of Mangrove ecotourism in the coastal regions of Bintan Island. This is intended to reduce institutional conflicts and disputes in Mangrove ecotourism management. Stability is required to reduce the possibility of pressure from external stakeholders so that the Mangrove ecotourism program can be implemented to achieve a common objective.

Insufficient information sources give rise to uncertainty. Nonetheless, stakeholder actors in collaborative governance must map the development of Mangrove ecotourism on Bintan Island by collecting as many information sources as possible, particularly those related to policies mutually agreed upon through the institutional forum for Mangrove ecotourism management on the island. The complexity of collaborative governance is primarily attributable to information saturation, which may prevent actors from capturing accurate data. In this regard, wisdom is required for collaborative governance decision-making based on mutually agreed-upon stakeholder requirements. On Bintan Island, human resources must be improved in terms of communication and comprehension of the mangrove ecotourism situation.

Table 2: Generalization of Relationships in 3 Concepts of Mangrove ecotourism development on Bintan Island. Source: processed by us, 2021

Stakeholders	Collaborative Governance	VUCA (Negative to Positive)
Public/Government	Mapping of common goals in the development of human resources of government institutions to be able to realize good performance according to the current needs of Mangrove ecotourism development in the coastal area of Bintan Island.	Able to protect conditions between stakeholders to initiate the strengthening of Mangrove ecotourism development on Bintan Island to create sustainable public services.
Private	Conducive participation that focuses on the same goal of creating Mangrove ecotourism management is far from the potential for conflicts between institutions where the role of the private sector can provide alternative forms in responding to the limitations of other stakeholders. This means that the support focuses on the existing institutional facilities of the stakeholders themselves.	Transparency in the form of clarity of information and objectives of developing Mangrove ecotourism in the coastal area of Bintan Island is oriented towards institutional capacity development that is more focused on straightforward programs.
Support	They are creating opportunities for collaborative Governance of mangrove ecotourism management so that the goals can be achieved quickly, meaning that regulations and rules governing uncertain conditions can answer each stakeholder's problems by creating opportunities oriented towards ecotourism destinations that have not been managed optimally.	Legitimacy in the form of programs that have been well realized to overcome the negative and positive impacts on the results of cooperation in Mangrove ecotourism management on Bintan Island.

Source: Own proceedings

In collaborative governance, the dearth of information creates ambiguity, which presents obstacles. It is essential to make room for interaction to clarify past events. Particularly for business-to-business discussions on developing mangrove ecotourism, the satisfaction of stakeholder requirements necessitates prioritization. Accurately understanding the priorities of travelers who visit Bintan Island's Mangrove ecotourism destinations is a requirement for stakeholders. Bintan Island ecotourism involving mangroves necessitates policy innovations to map tourists' needs. When developing mangrove ecotourism on Bintan Island, the government must operate as a facilitator, the private sector as a partner, and the local community as the leading conservation actor.

VI. Conclusion

To realize sustainable development, international collaboration is the basis that unites various stakeholders worldwide. Bintan Island's journey in managing mangrove ecotourism underscores the challenges of operating in a VUCA (volatile, uncertain, complex and ambiguous) environment, where uncertainty is the main thing. In conditions like these, the readiness of stakeholders and the effectiveness of collaborative governance mechanisms are very necessary.

Although stakeholders on Bintan Island demonstrate readiness and adaptability, a VUCA world demands continuous innovation and strategic alignment. In the face of instability and uncertainty, stakeholders often use coercive strategies, highlighting the need for improved performance management, organizational restructuring and stakeholder transparency in the public sector. As the EU stands as a beacon of collaborative governance and environmental stewardship, this partnership has great potential to address the complexities of mangrove conservation efforts in Bintan.

This study enriches the theoretical understanding of sustainable development by examining collaborative governance in the VUCA context, especially in ecotourism. Emphasizing stakeholder engagement and preparedness highlights how collaborative governance can effectively address the complexity and uncertainty inherent in natural resource management. Additionally, the report presents a differentiated framework that underscores the importance of adaptability, stakeholder engagement, and strategic alignment for sustainable ecotourism development.

Although this study acknowledges constraints, such as the specific context of Bintan Island, it invites future research to broaden the scope by examining diverse ecotourism conditions in different geographic and cultural landscapes. Comparative studies can reveal whether collaborative governance frameworks are universally applicable or unique to conditions characterized by VUCA dynamics. Additionally, longitudinal studies exploring the long-term impact of governance on sustainable development outcomes and the role of technological innovation in enhancing stakeholder engagement require further investigation. As we confront the complexities of sustainable development, let us make collaboration a guiding principle, forging partnerships that transcend borders and foster resilience in the face of uncertainty. Together, with stakeholders from diverse backgrounds and continents, we embark on a journey towards a future where sustainability thrives, guided by the principles of inclusivity, innovation and shared responsibility.

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