

Thinking styles and environmental leadership: Governance strategies in the Philippines' coastal areas

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ABSTRACT

This paper examines the application of the Herrmann Brain Dominance Model in local governance in the province of Negros Oriental, Philippines, particularly in the management of coastal areas. Leadership has shifted to include diverse thinking styles, for it has been found that a person's unique thinking style determines how things get done. The Herrmann Model has demonstrated this and given results on how a person leads regarding their predominant mode of thinking. In coastal management, where local governments face complex environmental issues, understanding thinking styles can enhance governance strategies. The study uses a mix of qualitative and quantitative design to assess the thinking styles and ecological problems in 07 local government units in Negros Oriental. Data were gathered through surveys, interviews, and documentary research. Results indicate that most of the local officers are analytical thinkers (42.85%) and organizational thinkers (35.71%) but lack team-oriented thinkers (14.28%) and creativity-oriented thinkers (7.14%), which does not let them create innovative solutions for sustainable coastal management. The study stresses integrating creative problem-solving and analytical skills to address environmental issues like habitat destruction, siltation, and overfishing. The findings suggest that while the local leaders are good at coping with the immediate environmental issues, they can improve their thinking flexibility for sustainability through leadership training, cross-sector collaboration, scenario planning, and developing sustainability policies to deal with the complex environmental challenges.

1. Introduction

The leadership concept has become more all-encompassing by accelerating the ever-growing complexities of governance, organizations, and societal structures. Leadership is no longer a simple set of directives on hierarchical levels but an activity conceived multidimensionally through cognitive processes, decision-making abilities, and interpersonal dynamics (Daft, 2000; Drucker, 1954). An illustrative framework that aids in clarifying this phenomenon is the Herrmann Brain Dominance Model (Herrmann & Herrmann-Nehdi, 2015), which emphasizes thinking style diversity as highly relevant to improved leadership, effective decision-making, communication, and teamwork. This stresses the critical role of cognitive diversity in addressing public governance challenges worldwide. At the national level, the Philippines is not yet exempted from criticism regarding public governance. Problems such as bureaucratic inefficiencies and understudy gaps pose hindrances in professionalizing political leadership efforts. A particular hassle in policy formulation is the blocking of implementation due to a lack of evidence-based, cognitive-driven decision-making (Salindo, 2018).

Being one of the resource-rich provinces, Negros Oriental, especially the coastal areas, has extreme management challenges in coastal governance. Major environmental issues encompassing habitat destruction, siltation, and overfishing threaten its marine ecosystems' delicate balance. Habitat destruction, instigated by uncontrolled coastal development and destructive fishing activities, influences biodiversity and the livelihoods of the local community. Deforestation and unsustainable agriculture also contribute to upland erosion that causes siltation into the coral reefs and seagrass beds, which reduces marine productivity. Moreover, overfishing poses enormous pressure on the fish stocks, thus compromising food security and economic stability in the coastal communities (Salindo, 2021). These interrelated issues, therefore, showed the multifaceted nature of coastal management since they interact with very complex political, economic, and social factors that lead to high governance demands (Azevedo et al., 2016; Noor et al., 2015; Scanes, 2018). Generally, the public officials of the first district of Negros Oriental in such coastal communities have found it challenging to integrate strategic governance with the environmental and socio-economic needs of their communities. This paper clarifies how brain dominance dictates the thinking styles influencing decision-making processes and public administration. A better understanding of these could help devise governance strategies more effective at assisting sustainable development and empowering local communities.

This paper intends to fill a knowledge gap by looking into the thinking styles of the first district public officials of Negros Oriental, utilizing Ned Herrmann's Brain Dominance Model. The study explores the intersection of thinking styles and political leadership, employing a novel approach in the context of a developing country with a specific focus on addressing the challenges of coastal governance in Negros Oriental. Unlike most previous studies, which were mainly driven by various corporate and educational contexts, this investigation is unique since it applies the Herrmann Brain Dominance Model to public administration contexts. Specifically, it addresses research questions such as What specific thinking styles are most prevalent among the public officials in Negros Oriental's coastal areas? What specific strategies can be implemented to overcome the hindrances in environmental governance within these communities? How do the identified thinking styles of leaders directly impact the effectiveness of ecological governance strategies? This contributes to the larger discourse of cognitive-driven strategies; ultimately, the study aims at making local communities capable of self-governance and bolstering governance outcomes while pushing strategic planning in socio-politically complex environments.

2. Theoretical basis

2.1. On thinking styles and leadership

Known as brain dominance theory, the Herrmann Brain Dominance Model, developed by Herrman in 1996, has been one of the essential frameworks that assist in exploring the concept of leadership effectiveness across sectors. The theory categorizes thinking styles into four brain quadrants: quadrant A- analytical, quadrant B - organizational, quadrant C - creative, and quadrant D-team-oriented. Hypothetically, each quadrant thinking style enhances a specific outcome of environmental governance. Analytical thinking improves policy formulation or data-driven decisions; organizational thinking streamlines governance processes; creative thinking generates innovative solutions to environmental problems; and team-oriented thinking promotes collaborative efforts in implementing sustainable practices (Herrmann & Herrmann-Nehdi, 2015; Salindo, 2018).

Studies in academic and corporate settings in the Philippines have utilized the Herrmann Brain Dominance Model to evaluate leadership styles and assess academic performance (Constantino, 2019; Zaballero, 2009). These applications demonstrate the model's capacity to enhance understanding of leadership behaviors and cognitive diversity. McNulty et al. (2018) suggested that cognitive diversity is essential to functional leadership in addressing complex

issues, such as those encountered during a crisis, particularly for leaders with whole-brain thinking capabilities. The research by Salindo (2018) also revealed that leaders with a balanced brain dominance approach are successful in long-term strategic planning and crisis management. Among leaders, those who activated both the left and right hemispheres are more adaptable in leadership, especially in strategic thinking, creativity building, and team dynamics during decision-making processes (Gupta & Kumar, 2020; Kazmi & Naaranoja, 2015).

Recent studies have further applied this framework to public administration and environmental projects, indicating its applicability in dealing with governance challenges. Leaders aware of and exploiting their cognitive strengths and weaknesses will make better decisions and facilitate communication and collaboration amongst members to achieve common purposes. For example, Eva et al. (2019) and Hallo et al. (2020) noted that the cognitive diversity of leaders enhances effective governance as leaders can better understand public administration's complexities at the local and national levels. This is most important in environmental projects, where decision-making often involves multiple stakeholders' interests, efficient resource management, and effective response to dynamic challenges.

According to Salindo (2018), "utilizers of the Herrmann Model are known for skills that help with handling issues within governance" (pp. 67-82) by not only managing the coordination of cross-sectoral initiatives but also public demand for innovation and accountability. These connotations indicate that the Herrmann Brain Dominance Model is valuable for establishing public governance leaders within specific, pragmatic approaches toward deciding and making strategic plans or being team members in diversified contexts and with complicated matters at hand.

2.2. On coastal management and local governance

Coastal management is one of the challenges that leaders face because environmental protection has to be balanced with social and economic development. Local governments, particularly coastal areas such as Negros Oriental, have a mandate for managing and sustaining resources (Azevedo et al., 2016; Noor et al., 2015; Scanes, 2018). Coasts are managed effectively only through the qualities of local officials who lead such projects; this would be held to meet environmental sustainability objectives while advancing community welfare interests (Abubakar et al., 2022).

Recent research emphasizes that participatory planning and decision-making are critical in ensuring the effective implementation of coastal management plans. The thinking styles of leaders, particularly those with an awareness of brain dominance, have proven beneficial in addressing some of the governance issues within coastal areas. In particular, thinking styles can play a central role in conflict resolution by using resources, enhancing sustainable eco-tourism, and providing direct benefits to local communities through coastal development projects (Neumann et al., 2017). Research by Zhang et al. (2024) and Warguez et al. (2023) further elaborates on the need for community participation in actions towards coastal management.

The above literature reviews prove that efficient local leaders should be strategic thinkers and involve the communities to work together and act in trust for one another. The theory of brain dominance insights reveals how leaders can participate more efficiently in the processes that lead to their inclusiveness and efficiency, further improving governance outcomes in the coastal regions.

3. Methodology

3.1. Research design and research locale

The research made use of a descriptive quantitative-qualitative design in determining the condition of the coastal areas within the first district of Negros Oriental as it evaluated the thinking styles of the Local Government Units across the province. The primary study sites were selected from the coastal localities from Vallehermoso to Bindoy. This selection is justified by data from

the 2021 Philippine Statistics Authority report, which identified seven of the country's top ten poorest cities and municipalities - each with a poverty incidence index of 50 or higher in 2015 - within northern Negros Oriental (Philippine Statistics Authority, 2021). These areas include the municipalities of Ayungon, Bindoy, Jimalalud, La Libertad, Tayasan, Vallehermoso, and Guihulngan City. Given their high levels of poverty, these locations represent critical sites for understanding challenges in coastal governance.

3.2. Research respondents and participants

The respondents were selected using stratified random sampling based on age, gender, and occupation. Slovin's formula was applied to determine the sample size, considering the population size and a margin of error 0.05. A total of 2,719 respondents were chosen to ensure both diversity and representativeness in the sample. On the other hand, 14 key decision-makers - mayors and vice-mayors - were purposively selected from the said LGUs.

3.3. Data gathering and instrumentation

Data collection entailed various methods, which included surveys, interviews, and documentary research. Gathering primary quantitative data utilized Ned Herrmann's Brain Dominance model Instrument (HBDI) to examine local government officials' thinking styles. This standard tool is designed to identify the dominant quadrants of the individual brain. The questionnaire is composed of three sections. The first section offered instructions in the form of a guide on how to score brain preferences in the respondents; point values assigned to every descriptor, considering how close it represented the respondent, were as follows: most were worth 20 points, moderately 12 points, a bit 06 points, and most unlike 0 points. The second section rated the respondent's brain preferences, where several self-descriptive statements were related to specific brain quadrants, which were highlighted through leadership styles. The third section comprised a glossary, providing definitions and explanations of the descriptors used in the second section. On the other hand, information on environmental issues in coastal regions was gathered using a variant of Salindo's (2021) questionnaire, which was translated into Cebuano for easier understanding. The questionnaire was divided into two parts: respondent profiling and identification of environmental issues. The respondents were given ample time to read through the items and mark their assessment of the ecological problems. Among the key issues reported by respondents from coastal municipalities and cities in the First District of Negros Oriental, there were habitat destruction, siltation, and overfishing. Qualitative data were derived from interviews with respondents about environmental and coastal management issues. Secondary data were sourced from reports and other government documents of the Department of Interior and Local Government.

3.4. Data analysis

Data analysis in this research was done both quantitatively and qualitatively. The quantitative data were analyzed using frequency percentages, which ranked the environmental issues based on the highest frequency percentages and provided subsequent rankings for other responses. This helped in a clear identification of the most significant environmental concerns. Braun and Clarke's (2012) framework for thematic analysis was applied in six steps for the qualitative data. Initially, codes were developed from interview responses, and themes were formed within the exact semantic domains. These themes were then explored to identify patterns, relationships, and meanings, which contributed to understanding the hindrances in environmental management. A descriptive analysis of relevant documents interpreted the relationship existing between the local government officials' thinking styles and the ecological management hindrances versus the issues created by these concerning the coastal environment. It led to the quantitative ranking of these issues, providing an exhaustive coverage of thematic investigations of data relevant to the research for an environmental examination of the area.

3.5. Ethical considerations

All participants were given informed consent to ensure methodological rigor and ethical responsibility. The entire research upheld the principles of ethics, while all the data were kept confidential at each stage. This ensured that any other researcher could replicate the study and that a complete appraisal of the region's coastal conditions and leadership dynamics was provided.

4. Result and discussion

4.1. Result

4.1.1. Thinking styles of local government officials

This study investigated brain dominance among mayors and vice mayors in coastal localities within Negros Oriental. Results reveal specific thinking preferences that influence leadership and decision-making structures within local governance. Most importantly, these results pinpoint a strong trend towards analytical and structured thinking among the local government officials that influenced their governance, especially in the decisions made and solving problems within the coastal management context, as shown in Table 1.

Table 1

Thinking Styles of Local Government Officials

Local Government Officials	Frequency of Brain Dominance of Local Government Officials				Total (%)
	Quadrant A (%)	Quadrant B (%)	Quadrant C (%)	Quadrant D (%)	
Mayors (N = 7)	3 (42.80)	1 (14.80)	2 (28.50)	1 (14.80)	7 (100.00)
Vice-Mayors (N = 7)	3 (42.80)	4 (57.14)	0 (0.00)	0 (0.00)	7 (100.00)
All (N = 14)	6 (42.85)	5 (35.71)	2 (14.28)	1 (7.14)	14 (100.00)

Source. The data are from "Herrmann Brain Dominance Model study on local government officials and survey on environmental challenges and issues in Negros Oriental LGUs" by P. P. Salindo, 2024, Unpublished research

The data show relevant insights into how the local government officials in Negros Oriental think and act, specifically when it comes to their considerations around the management of coastal areas. Some mayors and vice mayors prefer Quadrant A thinking, which means they use reason and evidence in solving problems. This is expected as leading figures in governance often prefer analytical approaches (Gupta & Kumar, 2020). Vice mayors also showed a keen interest in Quadrant B, which is focused on organization and planning, consistent with their role in operational management for this position (Salindo, 2018).

However, the case is reversed with Quadrants C and D, which show team-oriented and creative thinking. A few mayors and no vice-mayors displayed these characteristics, thus leaving a gap that thwarts long-term coherence and effective environmental management. The absence of creative and team-oriented thinking inhibits the nurturing of collaborative policy development, the involvement of stakeholders, and the production of innovative, sustainable solutions to habitat destruction, siltation, and overfishing. Creative thinking thus directly affects the interventions designed for these issues. For example, creative leadership promotes cooperative action among local governments, environmental organizations, and community groups in developing conservation programs like habitat restoration projects or sustainable fishing practices. Creative thinking also leads to developing new technologies that monitor and control siltation and policies regarding overfishing through alternative livelihood programs. Another creative thinking aspect in governance is the possibility of anticipating future environmental concerns, which leaders can mitigate by formulating proactive and visionary policies for ecological shifts that provide adaptive

solutions. These are essential as literature has identified the role of flexible thinking in solving complex problems of governance (Eva et al., 2019; Hallo et al., 2020). Local leaders, although good in analysis and organization, lack creative and collaborative leadership that would make them address multifaceted environmental challenges effectively.

4.1.2. *Hindrances in environmental management as perceived by the local government officials*

The study gives several important insights into local environmental practices and priorities. Among the 14 respondents, 50 percent reported focusing on protecting the environment. This demonstrates a significant concern for local communities to retain their natural resources, especially in coastal areas, where matters relating to environmental sustainability come into play. The results indicate the need for environmental protection in local governance and encourage further improvement towards waste management and community participatory activities for sustainability.

Table 2

Hindrances in Environmental Management

Environment	Frequency (N = 14)	Percentage
Protecting the environment	7	50.00
Collecting garbage	5	35.71
Establishing sanitary landfills, indifference and lackadaisical attitudes, and proper waste disposal	2	14.28

Source. The data are from “Herrmann Brain Dominance Model study on local government officials and survey on environmental challenges and issues in Negros Oriental LGUs” by P. P. Salindo, 2024, Unpublished research

Analysis of systemic barriers facing local environmental management reveals salient issues. Even with the apparent declaration of ensuring environmental protection through waste management, these issues portray gaps in solid waste management among the respondents, even though 50% of those interviewed regarded ecological protection as key. This commitment aligns with the existing literature that supports the need for sustainability for an ecological balance for a long time (Azevedo et al., 2016; Noor et al., 2015; Scanes, 2018). However, the findings highlight significant barriers preventing fully realizing environmental goals.

The main problem is that sanitary landfills, a development of modern advanced waste management techniques, do not get proper attention. While they know that collection is a critical issue, only 35.71% paid attention to appropriate disposal methods, including sanitary landfills, while only 14.28% found it significant. This means the system lacked appropriate resources, infrastructure, or a long-term strategy to manage complex waste. This approach limits waste management in the long term and reflects over-reliance on short-term action, typical of analytical thinking, according to research by Hallo et al. (2020) and McNulty et al. (2018). The primary issue is the lack of capacity and foresight toward implementing more sustainable practices, which are heavy with investment and strategy and sometimes do not see the light of day owing to financial and human resource constraints. As stated by the research of Abubakar et al. (2022). This is coupled with apathy and leniency towards waste management. Lack of community participation, insufficient education, and no effective mechanisms are the factors of this kind. The community’s apathy is a systemic disengagement from environmental responsibility, which is fueled by a gap in awareness-raising campaigns and community-driven initiatives (McNulty et al., 2018). Despite recognizing ecological protection as a priority, these barriers prevent active participation in waste management programs and hinder the development of more sustainable practices. No incentive structure pushes people and businesses to be environmentally friendly in terms of waste practices, which means sustaining practices that are not sustainable.

Another significant obstacle is the underrepresentation of team-oriented and creative leadership, which cannot effectively deal with complex environmental challenges. Quadrants C and D represent teamwork and innovative thinking and were the least represented in data. This gap in leadership can be seen in the failure to address long-term environmental goals, such as reducing ecological footprints through advanced waste management practices or fostering community engagement in waste reduction efforts. This creative leadership would encourage innovative, community-based solutions, thus creating collaborative efforts focused on environmental protection and waste management, with the focus coming closer to a holistic approach to environmental sustainability (Eva et al., 2019; Herrmann & Herrmann-Nehdi, 2015).

From advanced waste management infrastructure and community participation to insufficient leadership and planning, these systemic barriers indicate the need for more holistic, integrated approaches to local environmental management. Regional leaders should embrace a flexible, long-term solution of creative, team-oriented leadership promoting community involvement towards bridging gaps between high environmental protection priorities and lack of advanced waste management techniques. Such changes will address the systemic barriers that impede effective environmental management and improve the long-term sustainability of local ecosystems (Abubakar et al., 2022; Azevedo et al., 2016; Hallo et al., 2020).

4.1.3. *Environmental issues in the coastal areas as perceived by the communities*

Analysis of environmental issues across the different municipalities will reveal some clear trends. The data covers six towns and a city, amounting to 2,719 responses. The results show that the most severe environmental issues across the municipalities are habitat destruction and siltation, and overfishing also ranks as a significant concern, although much less widespread.

Table 3

Environmental Issues in Coastal Areas

LGUs /Issues (n = 2,719)	Destruction of habitat	Siltation	Overfishing
Ayungon (n = 391)	235	217	88
Bindoy (n = 386)	248	226	203
Guihulngan (n = 397)	238	205	169
Jimalalud (n = 381)	167	137	148
La Libertad (n = 386)	226	210	133
Tayasan (n = 385)	225	207	187
Vallehermoso (n = 393)	198	208	126
TOTAL	1,537	1,410	1,054

Source. The data are from “Herrmann Brain Dominance Model study on local government officials and survey on environmental challenges and issues in Negros Oriental LGUs” by P. P. Salindo, 2024, Unpublished research

Destruction of habitat leads the list, being the most prominent issue in the area, and 1,537 replies from all locals have been received. This end is significant since it is shown to provide a general outcry over the loss of natural habitats, which aligns well with previous studies indicating that habitat destruction has adverse effects on biodiversity and the health of ecosystems (Azevedo et al., 2016; Noor et al., 2015; Scanes, 2018). One respondent was noted to be regretful, saying, “Our forests and mangroves are disappearing, and with them, *our wildlife source*.” Such qualitative views underscore the importance of the problem about the people within the community: emotional and practical. The second most mentioned problem was siltation, with 1,410 responses. Siltation

in water bodies reduces water quality and affects the aquatic environment. According to previous studies, there is a high adverse impact on freshwater ecosystems, and better sediment management practices need to come into play (Abubakar et al., 2022). As one fisherfolk puts it, “*The rivers are so clogged with sediment now that fish are no longer abundant where they used to be.*” It was an excellent opportunity to point out how sedimentation in the river negatively affects communities. The third most identified problem was overfishing, which was recorded at 1,054. Though it occurs less than habitat destruction and siltation, overfishing is still one of the serious problems. This finding supports the literature on overfishing impacts on fish populations and marine ecosystems and points to the need for sustainability in fishing practices (Hallo et al., 2020). According to one community leader, “*If the overfishing continues, nothing will be left for future generations.*” This explains why policy intervention is required.

In that regard, the results support the prevailing theories in environmental management as these call for attention to habitat preservation and sediment control as fundamental conditions for health preservation in the ecosystem. Habitat destruction, siltation, and overfishing data prove the necessity of comprehensive environmental policies, management strategies, and sustainable management of resources as emphasized in the literature (Abubakar et al., 2022; Azevedo et al., 2016; Hallo et al., 2020; Noor et al., 2015; Scanes, 2018).

4.2. Discussion

The result of the thinking styles of local government officials of Negros Oriental reveals that local officials exhibit a dominant analytical style (Quadrant A) and organizational style (Quadrant B). This type of local government official best performs tasks through structured problem-solving and data-driven decisions, especially environmental management tasks, such as protecting natural resources and waste management (Abubakar et al., 2022; Constantino, 2019). An official with strong analytical and organizational skills can effectively deal with the immediate and measurable aspects of the environmental problem (Herrmann & Herrmann-Nehdi, 2015; Salindo, 2018).

However, the lack of team-oriented individuals in Quadrant C and creative thinking in Quadrant D might hinder their approach toward building innovative solutions for complex environmental problems (Hallo et al., 2020; McNulty et al., 2018). For example, sophisticated technologies for waste management and sustainable coastal practice often call for out-of-the-box thinking and strategic foresight in places where traditional thinking styles tend to fail (Kazmi & Naaranoja, 2015; Zhang et al., 2024). This gap evokes the necessity of involving more creative approaches besides the traditional analytical and organizational skills in enhancing the strategies for environmental management (Ison et al., 2024; Warguez et al., 2023). Training programs or leadership workshops aimed at strengthening team-oriented and creative thinking could be instrumental in bridging this gap and fostering more effective and innovative solutions to pressing environmental issues.

The results of the hindrances in environmental management indicate local ecological management priorities. The respondents stressed the protection of the environment, reflecting a strong sense of commitment to sustainability, consistent with the extant literature (Azevedo et al., 2016; Noor et al., 2015; Scanes, 2018). The focus indicates that the local leaders value preserving the environment but cannot deliver as effective community-driven solutions as they think. On the concerns related to waste collection, emphasizing this function’s role in public health and minimum ecological impact but still revealing the need for strategic foresight and more team-oriented leadership, factors represented by Quadrants C and D (Herrmann & Herrmann-Nehdi, 2015). The underemphasis on sanitary landfills and the existence of apathy indicate that more sophisticated forms of waste management and community engagement are underemphasized and linked to an overreliance on analytical thinking, typical of leaders who favor short-term actions over long-term

solutions (Hallo et al., 2020; McNulty et al., 2018). This gap underlines the importance of leadership development programs that encourage creative, collaborative problem-solving in waste management towards more sustainable and community-centered approaches. Mayors and vice-mayors better engage their communities by encouraging such thinking styles so that strategies for environmental management are innovative and inclusive, resulting in effective and sustainable outcomes (Ison et al., 2024; Warguez et al., 2023).

Among the environmental concerns are habitat destruction, siltation, and overfishing, which indicate short-term and long-term problems (Azevedo et al., 2016; Noor et al., 2015). While an analytical approach must be undertaken to manage such issues effectively, presenting responses in the light of teamwork and creative thinking will pose an all-rounded and innovative solution to these problems (Neumann et al., 2017; Scanes, 2018). Team-based approaches and innovative problem-solving techniques could bridge the gap between what the officials can do and what the environment management will demand. This method will help improve the effectiveness of solving intricate environmental problems (Daft, 2000; Drucker, 1954).

The implications of the results of the research findings among local government officials in Negros Oriental is that similar regions with environmental and governance challenges find analytical, organizational skills, team-oriented and creative thinking practical in addressing hindrances in environmental management such as resource protection and waste management, including regions facing long-term ecological issues, such as habitat destruction, siltation, and overfishing. Similar regions can equip local leaders with the tools to devise more strategic, forward-thinking solutions by initiating leadership development programs based on collaboration and innovation. Such initiatives help foster more inclusive and sustainable approaches to environmental strategies, improving both short-term interventions and long-term ecological outputs. Such an approach can be replicated in regions where governance structures and environmental challenges mirror those of Negros Oriental to strengthen further how their approaches can become effective and adaptable.

5. Conclusions and recommendations

The investigation by local officials within coastal localities in Negros Oriental revealed that thinking styles were generally analytical and organizational in managing near-term, measurable environmental tasks. Lack of team-oriented strategies and creative thinking styles have proven challenging in confronting issues related to habitat destruction, siltation, and overfishing, which require the combination of various pieces to work on an answer. The findings are that, while these officials are good systematic problem solvers, the underrepresentation of team-oriented and creative thinking will not allow for innovative solutions to such challenges. Such an imbalance impacts the long-term effectiveness of governance and impedes community engagement in environmental management. Filling this gap will require participatory governance, that is, through the development of inclusive, collaborative decision-making processes involving stakeholders from all sectors-both local communities, civil society, businesses, and government agencies-and thus creating flexibility and foresight for more effective and sustainable environmental governance. To overcome the resource constraint and change resistance, the local government can apply for funding from external sources, use low-cost solutions, implement phased implementation, and include stakeholders at the early stages of the process. Educating the community, finding champions, quick wins, and incentives can reduce resistance to participatory governance. These resonate with the international concerns environmental governance addresses; hence, they are necessary integrated, imaginative, and collaborative responses to vital environmental issues. Implementing these makes local governance stronger and participates in the universal move toward sustainability.

Future studies are suggested to look into how introducing diverse thinking styles could

improve the management of environmental issues. The practical applications include curricular training programs to instill team-oriented strategies and creative problem-solving skills among local government officials. Further research in this context requires how different cognitive styles will impact environmental policy outcomes and what methods can be found that allow team-oriented strategies and creativity to better integrate into the governance process. The holistic approach to environmental management and policy development concerning short-term and long-term insights is intended to enhance sustainability challenges.

SCIENTIFIC CONTRIBUTION

The manuscript clearly identifies a research gap; the manuscript opens new directions for further research; the manuscript offers policy /managerial /technological implications.

AUTHOR CONTRIBUTIONS

CRedit: [**Philner Pantalita Salindo**]: Conceptualization, Methodology, Investigation, Formal Analysis, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision, Software.

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Credit authorship contribution statement

Philner P. Salindo - conception of research, the conduct of research, writing, and editing of the manuscript, supervising, data gathering, proofreading, encoding.

June Keziah Bandico Salindo - Investigation, Validation, Project Administration.

Declaration of competing interest

The author has no conflicts of interest to disclose.

Declaration of use of generative AI and AI-assisted technologies

While preparing this work, the author(s) utilized tools such as ChatGPT and Quill Bot to help organize his thoughts and improve grammatical accuracy. Following these tools, the author(s) thoroughly reviewed and edited the content to ensure it meets the publication's standards. They take full responsibility for the final version.

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