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Optimizing Environmental Governance Towards a HIBRIDA Barru: A Collaborative Governance Approach to Sustainable Development

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ABSTRACT

Environmental governance has become a strategic issue in achieving sustainable development, particularly in regions facing increasing environmental challenges and demands for inclusive governance. The concept of a HIBRIDA Barru emphasizes the integration of environmental sustainability, technological innovation, and community participation as a foundation for regional development. This study aims to analyze the optimization of environmental governance towards the realization of a HIBRIDA Barru through a collaborative governance approach. A qualitative descriptive method was employed to explore the roles and interactions of key stakeholders, including local government agencies, community organizations, the private sector, and environmental groups. Data were collected through in-depth interviews, observations, and document analysis and were analyzed using data reduction, data display, and conclusion-drawing techniques. The findings reveal that collaborative governance has played a significant role in strengthening environmental management by fostering stakeholder participation, enhancing coordination mechanisms, and promoting shared responsibility in environmental protection efforts. Furthermore, the integration of digital technologies and community-based environmental initiatives has improved environmental monitoring, resource management, and public awareness. However, challenges remain, including limited institutional capacity, resource constraints, and varying levels of stakeholder commitment. The study concludes that optimizing environmental governance through collaborative governance provides an effective framework for achieving sustainable development and advancing the HIBRIDA Barru vision. Strengthening cross-sector collaboration, improving digital infrastructure, and enhancing community engagement are essential for ensuring long-term environmental sustainability and regional resilience.

INTRODUCTION

Sustainable development has become a fundamental paradigm in regional development planning across the world, including Indonesia. This paradigm emphasizes the balance between economic growth, environmental preservation, and social welfare to ensure that the needs of the present generation are met without compromising the ability of future generations to meet their own needs. In this context, environmental governance plays a crucial role as an instrument for directing development policies and practices toward ecological sustainability. According to the United Nations (2015), the achievement of the

Sustainable Development Goals (SDGs) largely depends on the ability of governments and societies to integrate environmental considerations into all aspects of development planning and implementation. Therefore, strengthening environmental governance has become a strategic necessity for ensuring sustainable regional development.

Environmental challenges such as pollution, land degradation, climate change, biodiversity loss, and inadequate waste management continue to threaten sustainable development efforts. These issues demonstrate that conventional development approaches are no longer sufficient to address the increasingly complex environmental problems faced by modern societies. The United Nations Environment Programme (2024) highlights that growing pressures on natural resources require governance systems that are adaptive, participatory, and capable of fostering collaboration among multiple stakeholders. Consequently, local governments are encouraged to develop innovative strategies that integrate environmental sustainability with technological advancement and community engagement to achieve long-term development objectives.

Over the past few decades, the concept of environmental governance has emerged as a comprehensive framework for addressing environmental issues through the involvement of multiple actors and institutions. Environmental governance extends beyond the traditional role of government by incorporating the participation of private sector organizations, civil society groups, academic institutions, and local communities in environmental decision-making processes. Lemos and Agrawal (2006) define environmental governance as the set of regulatory processes, mechanisms, and organizations through which political actors influence environmental actions and outcomes. This approach is increasingly recognized as essential for managing environmental resources effectively and ensuring sustainable development outcomes.

Among the various governance approaches, collaborative governance has gained significant attention as a mechanism for addressing complex public issues, including environmental management. Collaborative governance emphasizes the active participation of governmental and non-governmental stakeholders in collective decision-making processes. According to Ansell and Gash (2008), collaborative governance refers to formal and consensus-oriented decision-making arrangements where public agencies engage non-state stakeholders in policy formulation and implementation. This approach enhances transparency, accountability, stakeholder trust, and shared responsibility, thereby increasing the effectiveness of environmental management initiatives and promoting sustainable development.

Barru Regency, located in South Sulawesi Province, possesses considerable potential for sustainable regional development through the integration of environmental management, technological innovation, and community participation. However, the region also faces environmental challenges associated with urbanization, resource utilization, and socio-economic transformation. In response to these challenges, the concept of HIBRIDA Barru has emerged as a strategic development vision that seeks to combine environmental sustainability, digital transformation, and inclusive governance. The HIBRIDA Barru concept reflects an innovative approach to regional development by promoting the integration of ecological protection, technological advancement, and citizen participation within a unified governance framework.

Digital transformation has become an important catalyst for improving environmental governance in the contemporary era. The utilization of digital technologies, such as environmental information systems, smart monitoring platforms, geographic information systems (GIS), and digital public participation tools, can significantly enhance the effectiveness and efficiency of environmental management. Vial (2019) argues that digital transformation enables organizations and governments to redesign operational processes and decision-making systems through the strategic use of digital technologies. In the context of HIBRIDA Barru, digital innovation can facilitate data-driven environmental management, improve transparency, and strengthen communication between government institutions and the public.

In addition to technological advancement, community participation remains a critical component of successful environmental governance. Sustainable environmental management cannot be achieved solely through government intervention; rather, it requires the active involvement of local communities in planning, implementation, monitoring, and evaluation processes. Ostrom (2010) emphasizes that sustainable resource management is more likely to succeed when local stakeholders are actively engaged in governance arrangements and collective decision-making. Therefore, empowering communities and enhancing public participation are essential strategies for achieving environmental sustainability and strengthening the resilience of regional development initiatives.

Previous studies have demonstrated that effective environmental governance depends largely on the quality of collaboration among stakeholders. Emerson, Nabatchi, and Balogh (2012) argue that collaborative governance can enhance institutional capacity, strengthen inter-organizational coordination, and generate innovative solutions to complex public problems. Furthermore, Biermann et al. (2017) emphasize that achieving sustainable development goals requires governance systems that integrate multiple actors, sectors, and policy domains. Despite the growing body of literature on environmental governance and collaborative governance, limited research has examined how these approaches can be optimized within the context of HIBRIDA Barru. Therefore, this study aims to analyze the optimization of environmental governance toward a HIBRIDA Barru through a collaborative governance approach, with a particular focus on promoting sustainable development, stakeholder collaboration, and environmental sustainability at the regional level.

RESEARCH METHOD

This study employed a qualitative descriptive approach to analyze the optimization of environmental governance toward the realization of HIBRIDA Barru through a collaborative governance framework. A qualitative approach was selected because it enables researchers to explore in depth the interactions, perceptions, and collaborative processes among stakeholders involved in environmental management and sustainable development initiatives. The research focused on understanding how government institutions, local communities, private sector actors, and environmental organizations collaborate in planning, implementing, and evaluating environmental programs within the HIBRIDA Barru initiative. According to Creswell and Creswell (2018), qualitative research is appropriate for exploring social phenomena and understanding the meanings that individuals or groups assign to a particular issue or process.

The research was conducted in Barru Regency, South Sulawesi, Indonesia, as the region has actively promoted the HIBRIDA Barru concept as a strategy for integrating environmental sustainability, community participation, and technological innovation. Informants were selected using a purposive sampling technique based on their involvement and knowledge of environmental governance activities. The participants included officials from the Environmental Agency, sub-district and village government representatives, community leaders, environmental activists, and local residents participating in environmental programs. Data were collected through in-depth interviews, direct observations, and document analysis. Interviews were conducted to obtain comprehensive information regarding stakeholder roles, collaborative mechanisms, environmental challenges, and the implementation of sustainability-oriented policies. Observations and documentation were used to validate and enrich the information obtained from interviews.

Data analysis followed the interactive model proposed by Miles, Huberman, and Saldaña (2014), consisting of data condensation, data display, and conclusion drawing. Information gathered from interviews, observations, and documents was systematically organized, categorized, and interpreted according to themes related to collaborative governance and environmental sustainability. To ensure the credibility and trustworthiness of the findings, this study employed source triangulation and method triangulation by comparing information obtained from different informants and data collection techniques. Through this process, the study aimed to generate a comprehensive understanding of how collaborative governance contributes to optimizing environmental governance and advancing sustainable development within the HIBRIDA Barru framework.

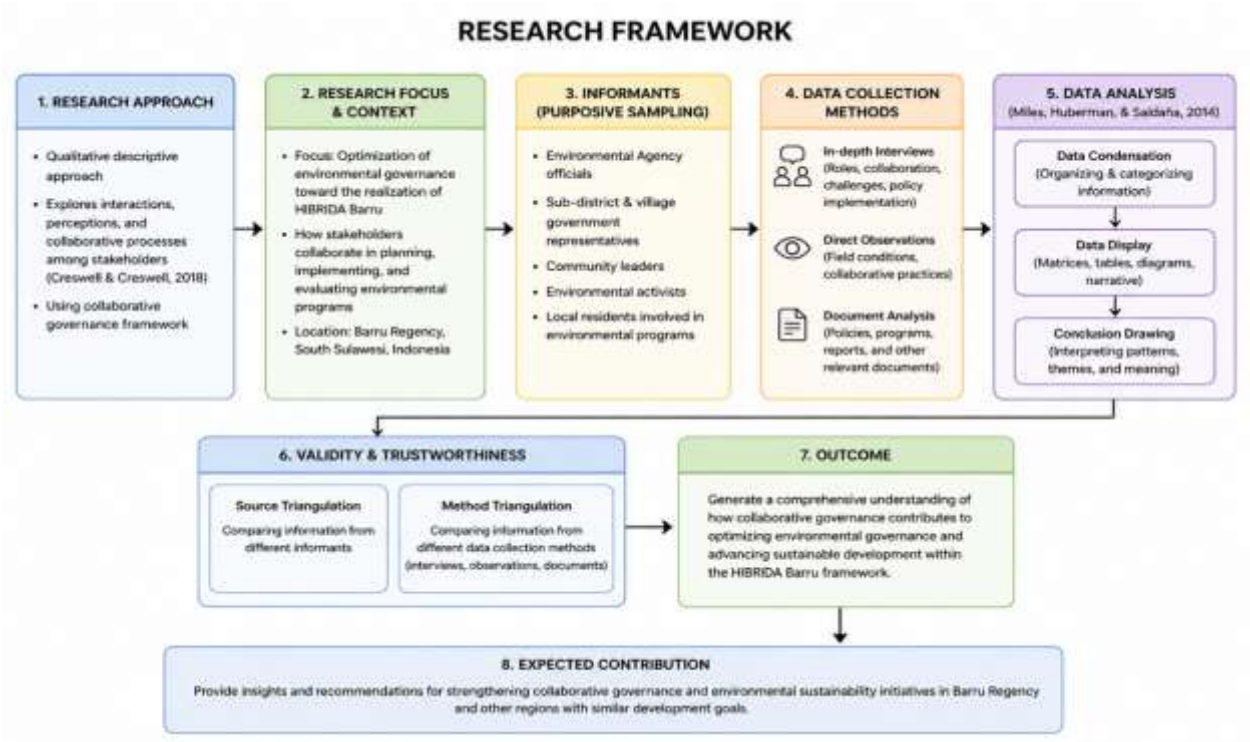

Figure 1 Research Framework for Optimizing Environmental Governance toward the Realization of HIBRIDA Barru through Collaborative Governance

Figure 1 illustrates the overall research framework employed in this study. The framework begins with a qualitative descriptive approach using collaborative governance as the analytical perspective to examine environmental governance within the HIBRIDA Barru initiative. The research focuses on the collaboration among government institutions, local communities, private sector actors, and environmental organizations. Data are collected through in-depth interviews, direct observations, and document analysis involving purposively selected informants. The collected data are analyzed using the interactive model of Miles, Huberman, and Saldaña, consisting of data condensation, data display, and conclusion drawing. To ensure the credibility of the findings, source and method triangulation are applied. The framework ultimately leads to a comprehensive understanding of how collaborative governance contributes to optimizing environmental governance and advancing sustainable development in the HIBRIDA Barru framework.

RESEARCH RESULTS AND DISCUSSION

Research results

Optimizing Environmental Governance Towards a HIBRIDA Barru: A Collaborative Governance Approach to Sustainable Development

1. Environmental Governance Optimization through the Green Leaf Program
   The findings reveal that the Environmental Agency of Barru Regency has implemented innovative environmental governance strategies to support the HIBRIDA Barru vision through the Green Leaf (*Daun Hijau*) Program. According to Gunawan, S.Sos., Secretary of the Environmental Agency, the program adopts the "One Civil Servant, One Tree" initiative, encouraging every government employee to plant a productive tree such as mango, papaya, or other fruit-bearing species. This strategy reflects the integration of ecological sustainability and community welfare within environmental governance practices. The program is designed not only to increase green coverage but also to generate long-term socioeconomic benefits for local communities through productive vegetation. Such an initiative demonstrates how environmental governance can move beyond regulatory functions toward creating tangible environmental and economic value. The findings indicate that the Green Leaf Program represents a practical manifestation of the HIBRIDA Barru concept, combining environmental conservation with sustainable community empowerment.
2. Strategic Environmental Policies as the Foundation of HIBRIDA Barru
   The study found that environmental cleanliness serves as the primary policy priority within the HIBRIDA Barru framework. The Environmental Agency considers environmental cleanliness as the foundation for creating a green, beautiful, and sustainable environment. Government efforts focus not only on waste management but also on maintaining urban greenery, preserving public spaces, and ensuring environmental aesthetics. The findings suggest that environmental governance in Barru has shifted toward a preventive and sustainability-oriented model where cleanliness and ecological preservation are viewed as interconnected objectives. Such an approach aligns with sustainable development principles that emphasize environmental quality as a prerequisite for social well-being and economic growth. The prioritization of environmental maintenance, landscaping, and green infrastructure demonstrates the

government's commitment to creating an environmentally resilient region capable of supporting future development goals.

3. Challenges in Environmental Policy Implementation
   Despite significant progress, several challenges continue to hinder the effective implementation of environmental governance initiatives. The findings indicate that waste management remains the most persistent issue faced by local authorities. Although waste segregation facilities have been provided to households, public understanding of proper waste management practices remains relatively low. As a result, waste separation and recycling initiatives are not consistently implemented at the community level. The Environmental Agency has responded by conducting educational campaigns, community outreach programs, and environmental awareness activities. However, the persistence of behavioral challenges suggests that environmental governance requires not only infrastructural support but also continuous efforts to transform public attitudes and practices. These findings highlight that sustainable environmental governance depends heavily on environmental literacy and citizen engagement as much as on institutional interventions.
4. Collaborative Governance through Inter-Institutional Coordination
   A key finding of this study is the strong emphasis on collaborative governance in environmental management. The Environmental Agency actively coordinates with district administrations, village governments, schools, and community organizations to promote environmental awareness and participation. Through regular communication, environmental education programs, and joint environmental activities, local authorities seek to establish shared responsibility for environmental protection. This collaborative approach facilitates the dissemination of environmental values and encourages collective action among stakeholders. The findings demonstrate that effective environmental governance cannot be achieved solely through top-down government interventions but requires active collaboration among governmental and non-governmental actors. The HIBRIDA Barru initiative therefore serves as a platform for strengthening partnerships and fostering a culture of environmental stewardship across different sectors of society.
5. Environmental Outcomes and Performance Indicators
   The implementation of HIBRIDA Barru has generated several observable environmental improvements. According to the Environmental Agency, one of the most significant indicators of success is the increasing cleanliness of public spaces and residential areas. Improvements have also been observed in waste management systems, where waste segregation and collection processes have become more organized. Furthermore, community awareness regarding environmental protection has increased substantially. Residents are becoming more conscious of their role in maintaining environmental quality and participating in environmental initiatives. These outcomes suggest that environmental governance interventions have begun to produce measurable impacts on both environmental conditions and public behavior. The findings indicate that sustainable environmental governance is most effective when physical environmental improvements are accompanied by positive changes in community attitudes and environmental responsibility.

6. Community Awareness as a Driver of Sustainable Environmental Governance
   At the village and sub-district levels, environmental governance is increasingly supported by heightened public awareness regarding environmental sustainability. Interviews with Muhajira, S.E., a local government official, reveal that environmental preservation has become a shared responsibility among government institutions and community members. The implementation of environmental programs has been strengthened by public campaigns associated with environmental awards and assessments, motivating both officials and citizens to improve environmental quality. Community awareness has contributed to cleaner public spaces, greener neighborhoods, and more structured environmental management practices. The findings suggest that environmental governance becomes more effective when environmental responsibility is internalized by local communities rather than being perceived solely as a government obligation.
7. Community Participation in Environmental Programs
   The study found that community participation constitutes one of the most significant elements of HIBRIDA Barru's environmental governance strategy. Residents actively engage in community clean-up activities, waste management programs, and environmental maintenance initiatives. Regular collective work activities (*gotong royong*) have become a visible expression of community commitment to environmental sustainability. These activities strengthen social cohesion while simultaneously improving environmental quality. The collaborative efforts between local governments and citizens demonstrate that community participation serves as both a governance mechanism and a catalyst for behavioral change. Through collective action, communities contribute directly to achieving environmental objectives while reinforcing a sense of shared ownership over environmental resources.
8. Institutional Synergy and Collaborative Environmental Governance
   The findings further indicate that strong institutional collaboration exists between local governments and the Environmental Agency. This synergy is reflected in joint environmental campaigns, community education programs, waste management initiatives, and environmental monitoring activities. Local authorities function as intermediaries between government agencies and residents, facilitating communication and encouraging public participation. Such collaboration enhances policy implementation by ensuring that environmental programs are adapted to local conditions and community needs. The findings demonstrate that collaborative governance provides an effective framework for addressing environmental challenges by integrating institutional resources, local knowledge, and community participation. Consequently, the HIBRIDA Barru initiative illustrates how cross-sector collaboration can strengthen environmental governance and support sustainable development objectives.
9. Sustainable Waste Management and Community Engagement
   Another important finding concerns the growing role of community-based waste management programs, particularly waste banks and waste assessment initiatives. Community members actively participate in sorting, weighing, and managing recyclable waste, reflecting increased environmental awareness and responsibility. These

activities not only contribute to environmental cleanliness but also promote the development of a circular economy by encouraging waste recycling and resource recovery. Participants emphasized that effective waste management requires changes in public mindset rather than merely increasing infrastructure. Environmental sustainability can only be achieved when citizens recognize their responsibility for managing waste responsibly. The findings therefore highlight the importance of integrating environmental education, community empowerment, and sustainable waste management systems within the broader framework of environmental governance.

10. Toward a HIBRIDA Barru through Collaborative Environmental Governance
    Overall, the study demonstrates that the HIBRIDA Barru initiative represents an innovative model of environmental governance grounded in collaborative governance principles. The integration of environmental policies, community participation, institutional coordination, and sustainable waste management has contributed significantly to environmental improvement and public awareness. Although challenges remain, particularly regarding public participation consistency and environmental literacy, the findings suggest that collaborative governance provides a strong foundation for achieving sustainable development. The success of HIBRIDA Barru depends on maintaining stakeholder commitment, strengthening environmental education, and expanding community-based environmental initiatives. Through these efforts, Barru Regency can further advance its vision of becoming a sustainable, environmentally responsible, and socially inclusive region.

Discussion

The findings of this study indicate that environmental governance in Barru Regency has undergone a significant transformation through the implementation of the HIBRIDA Barru concept, which emphasizes environmental sustainability, community participation, and institutional collaboration. One of the main findings is the implementation of the Green Leaf Program (*Daun Hijau*), which encourages civil servants to plant productive trees as part of environmental conservation efforts. This initiative reflects the principles of environmental governance proposed by Lemos and Agrawal (2006), who argue that environmental management should involve various actors and integrate ecological objectives with social and economic benefits. The Green Leaf Program demonstrates that environmental governance is not merely focused on environmental protection but also on generating sustainable socioeconomic value for local communities. By promoting productive tree planting, the government simultaneously enhances environmental quality, food security, and community welfare. Therefore, the HIBRIDA Barru initiative represents an innovative governance model that aligns environmental sustainability with regional development goals.

Another important finding concerns the prioritization of environmental cleanliness as a strategic policy direction within the HIBRIDA Barru framework. The emphasis on maintaining clean public spaces, improving waste management systems, and expanding green infrastructure illustrates the government's commitment to achieving sustainable development. This finding supports the Sustainable Development Goals (SDGs), particularly Goal 11 on sustainable cities and communities and Goal 13 on climate action, which emphasize the importance of environmental quality in supporting human well-being (United

Nations, 2015). The study reveals that environmental governance in Barru has moved beyond reactive environmental management toward a more preventive and sustainability-oriented approach. Such a shift is crucial because environmental degradation often results from inadequate preventive measures and limited environmental awareness. Consequently, integrating environmental considerations into regional development planning serves as a strategic mechanism for achieving long-term sustainability and resilience.

The study also highlights the importance of collaborative governance in addressing environmental challenges. The Environmental Agency actively collaborates with local governments, educational institutions, community organizations, and citizens to implement environmental programs and awareness campaigns. This finding is consistent with the collaborative governance framework developed by Ansell and Gash (2008), which emphasizes consensus-building, stakeholder engagement, and shared decision-making in public policy implementation. The success of environmental initiatives in Barru demonstrates that environmental governance becomes more effective when responsibilities are distributed among multiple stakeholders rather than concentrated solely within government institutions. Through collaboration, stakeholders contribute resources, knowledge, and expertise that enhance policy implementation and environmental outcomes. Therefore, the HIBRIDA Barru initiative provides empirical evidence that collaborative governance can strengthen institutional effectiveness and promote sustainable environmental management.

Despite these achievements, the findings reveal that waste management remains a major challenge in achieving environmental sustainability. Although waste segregation facilities and environmental education programs have been introduced, public participation in waste sorting and recycling remains inconsistent. This condition supports Ostrom's (2010) argument that sustainable resource management requires active participation and collective responsibility from local communities. Environmental policies alone are insufficient if citizens do not internalize environmental values and adopt environmentally responsible behaviors. The persistence of waste management problems indicates that behavioral change remains one of the most critical factors in environmental governance. Therefore, environmental education, public awareness campaigns, and community empowerment programs should be continuously strengthened to encourage long-term behavioral transformation and improve environmental outcomes.

Furthermore, the findings demonstrate that community participation plays a crucial role in supporting environmental governance and sustainable development. Activities such as community clean-up campaigns, waste bank programs, and collective environmental maintenance initiatives have strengthened social cohesion while improving environmental quality. This finding aligns with Emerson, Nabatchi, and Balogh's (2012) collaborative governance model, which emphasizes the importance of stakeholder engagement, trust-building, and shared motivation in achieving collective goals. The active involvement of communities in environmental programs reflects a growing sense of environmental responsibility among citizens. Consequently, the HIBRIDA Barru concept can be regarded as a practical example of how collaborative governance, community empowerment, and environmental sustainability can be integrated into a comprehensive regional development strategy. By maintaining stakeholder commitment, strengthening environmental literacy, and

expanding community-based initiatives, Barru Regency can further enhance its environmental governance capacity and achieve its vision of sustainable development.

CONCLUSION

This study concludes that the optimization of environmental governance toward a HIBRIDAH Barru has been effectively supported through the implementation of collaborative governance involving government institutions, local communities, educational institutions, and other stakeholders. The findings demonstrate that environmental programs such as the Green Leaf Program, environmental cleanliness initiatives, waste management activities, and community-based environmental campaigns have contributed significantly to improving environmental quality and public awareness. The collaborative approach has strengthened coordination among stakeholders, enhanced community participation, and promoted shared responsibility in environmental management. Furthermore, the integration of environmental sustainability principles with community empowerment and institutional collaboration reflects the core characteristics of the HIBRIDAH Barru concept as a model of sustainable regional development.

However, several challenges remain, particularly in waste management practices, environmental literacy, and the consistency of community participation. Although environmental awareness has increased, behavioral changes related to waste sorting and environmental conservation are not yet fully institutionalized among all members of society. Therefore, the sustainability of environmental governance initiatives depends on continuous stakeholder commitment, stronger environmental education programs, and improved institutional capacity. Overall, collaborative governance has proven to be an effective framework for optimizing environmental governance and supporting the realization of sustainable development in Barru Regency.

The local government of Barru Regency should strengthen collaborative governance mechanisms by expanding partnerships with community organizations, educational institutions, private sector actors, and environmental groups to ensure broader participation in environmental management programs. Greater emphasis should also be placed on integrating digital technologies into environmental monitoring, reporting, and public participation systems to support the realization of the HIBRIDAH Barru vision.

In addition, continuous environmental education and awareness programs should be implemented to foster long-term behavioral change, particularly in waste management and environmental conservation practices. Community-based initiatives such as waste banks, recycling programs, and environmental volunteer movements should be further supported through funding, technical assistance, and institutional facilitation. Future researchers are encouraged to examine the effectiveness of collaborative governance quantitatively or through comparative studies across different regions to provide a more comprehensive understanding of sustainable environmental governance and its contribution to regional development.

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