Collaborative Governance for Rabies Mitigation in North Central Timor Regency

Hendrikus Hironimus Botha [1,*] , **Yohanes Imanuel Naif** [2] ,
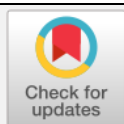and **Pionisius Minggu** [1]

[1] Department of Public Administration, Faculty of Social and Political Sciences,
University of Timor, 85613, North Central Timor Regency, East Nusa Tenggara Province,
Indonesia
[2] Department of Government Studies, Faculty of Social and Political Sciences,
University of Timor, 85613, North Central Timor Regency, East Nusa Tenggara Province,
Indonesia
* Corresponding Author: hendrabotha@gmail.com

ARTICLE INFO

ABSTRACT

This study examines government collaboration in preventing and managing rabies in North Central Timor Regency. A descriptive qualitative approach is employed, utilizing the Collaborative Governance process framework developed by Ansell and Gash, which encompasses five stages: Initial Conditions, Facilitative Leadership, Institutional Design, Collaborative Process, and Intermediate Outcomes. The findings reveal that while the government has established a Command Post for Emergency Handling of Rabies Outbreaks as part of its collaborative efforts, significant challenges remain. Key weaknesses include insufficient alignment in the incentive distribution mechanisms for joint working groups and limited collaborative activities among agencies and institutions involved in the Rabies Disease Handling Command Post. These shortcomings hinder the full realization of Collaborative Governance objectives, specifically reducing rabies cases among animals and humans. The study underscores the necessity of developing technical guidelines for equitable incentive distribution and designing integrated activities that actively engage all stakeholders in rabies management. These measures are critical to achieving the intended outcomes of the Collaborative Governance process.

1. Introduction

Development is a concept that can be defined as a deliberate effort to bring about positive change. This concept of development requires synergy among various societal elements. Ideally, development efforts encompass all aspects of life, both physical and non-physical. Therefore, there must be a balance between the two; development must be integrated and should not rely solely on one aspect (Sandy, 2020). Among these aspects, health is one of the key areas requiring attention at every step of development.

In the context of health development, the efforts required go beyond curative and rehabilitative measures and must also include promotive and preventive measures. According to the Republic of Indonesia Law Number 36 of 2009 on Health, promotive efforts are defined as activities or a series of health service activities prioritizing health promotion. Meanwhile, preventive efforts aim to prevent health issues or diseases. Promotive and preventive efforts are crucial for determining the public health level in a given area. It is assumed that if these efforts are carried out on a large scale, they will reduce the spread of diseases or viruses that endanger health and, on the other hand, improve the overall quality of public health. Meanwhile, curative efforts, as defined by the law, involve treatment activities aimed at curing diseases, alleviating suffering, controlling diseases, or preventing disabilities to maintain optimal quality of life. Rehabilitative efforts are defined as activities aimed at reintegrating individuals into society so they can function as productive members to the best of their abilities.

The North Central Timor (Timor Tengah Utara - TTU) Regency government currently faces a significant health challenge, namely rabies outbreaks, which have resulted in fatalities. The first rabies case in TTU Regency was reported on November 7, 2023 (Media Indonesia, 2023). Initial data indicated 202 cases of bites from Rabies Transmitting Animals (Hewan Penular Rabies - HPR) in November, spread across 15 health centers and 12 sub-districts (Kompas.com, 2023). By December, the cases had increased to 328, with two deaths diagnosed with rabies (Lembaga Penyiaran Publik Radio Republik Indonesia, 2023). A Daily Report from January 13, 2024, recorded 493 HPR bite cases and three fatalities (Dinas Kesehatan Kabupaten Timor Tengah Utara, 2024).

This issue did not emerge suddenly but followed a long process of disease transmission. The first HPR bite on Timor Island occurred in Fenun Village, South Amanatun Sub-district, South Central Timor Regency. This case was confirmed positive for rabies after a laboratory test conducted on May 28, 2023, by the Denpasar Veterinary Center (BBC News Indonesia, 2023). The first human rabies case in TTU Regency was confirmed on November 7, 2023 (VictoryNews, 2023). These facts indicate that the spread of rabies in Timor Island, particularly in TTU Regency, could have been mitigated with a quicker response from the government.

Referring to the efforts required to ensure public health stability as outlined in the Health Law, the TTU Regency government needs to implement promotive and preventive measures. Promotive activities include widespread public education across the region to increase awareness of rabies and proper actions to take when bitten by an HPR. Preventive measures involve recording and vaccinating HPR, especially community-owned dogs. Data collection is crucial for determining the number of HPRs and ensuring an adequate vaccine supply for efficient vaccination processes. Achieving these objectives requires Collaborative Governance, which involves cooperation among government agencies, the community, and private sectors/NGOs.

The analysis of promotive and preventive measures undertaken by the TTU Regency government reveals weaknesses, particularly when compared to the rising rabies cases. Promotive efforts demand collaboration with multiple stakeholders to ensure that the target

community understands rabies and its management. The increasing number of rabies cases indicates that the promotive activities have not been effective. Similarly, preventive efforts, such as data collection and vaccination of HPR, have not been optimized. For instance, out of 43,783 dogs in the TTU Regency, only 8,057 have been vaccinated (Dinas Kesehatan Kabupaten Timor Tengah Utara, 2024).

Therefore, this study aims to comprehensively analyze the strategies employed by the TTU Regency government in controlling rabies outbreaks by applying the Collaborative Governance framework. This includes examining the roles and interactions of stakeholders, identifying challenges in implementation, and proposing actionable solutions to improve coordination, resource management, and community engagement in mitigating rabies transmission effectively.

2. Literature Review
2.1. Collaborative Governance

Philosophically, collaboration is defined as an effort by multiple parties to achieve a shared goal (Arrozaaq, 2016). From a public administration perspective, collaboration refers to cooperative work or collective efforts involving various parties to accomplish a specific objective (Noor et al., 2022). This understanding aligns with the concept of administration, which is broadly defined as the entire process of cooperation between two or more individuals, guided by rational principles, to achieve predetermined goals (Siagian, 2005). Within public administration literature, the term governance is often used to describe the relationship between organizations. Governance is not limited to the participation of public institutions in policy formulation and implementation but also involves the interconnectedness of various organizations in achieving public objectives (Noor et al., 2022).

Samatupang and Sridharan describe collaboration as the process of bringing together parties with diverse interests to establish a shared vision, reach consensus on a problem, create solutions, and prioritize common values to arrive at mutually beneficial decisions (Pitriyanti et al., 2022). From these definitions, collaboration can be seen as a solution to the limitations of individuals or organizations in achieving shared goals or resolving public issues.

In their book *Collaborative Governance: New Era of Public Policy in Australia*, Janine O'Flynn and John Wanna explain that collaboration within government organizations is essential for solving complex problems and achieving targeted and effective goals (O'Flynn & Wanna, 2008). Similarly, Donahue and Zeckhauser argue that Collaborative Governance is a mechanism through which governments achieve public objectives by fostering partnerships between organizations and individuals (Puspaningtyas, 2022). Ansell and Gash define Collaborative Governance as a governance arrangement where one or more public institutions actively engage non-governmental actors in a formal, consensus-driven, and consultative policy-making process, with the objective of creating or implementing public policies or managing public programs and assets (Ansell & Gash, 2008). Collaborative Governance has demonstrated its effectiveness in addressing complex environmental challenges by promoting joint decision-making and actions, resulting in inclusive and contextually relevant solutions (Abdulai et al., 2024).

Based on the definitions above, Collaborative Governance can be interpreted as a cooperative approach to addressing public issues through the formulation and implementation of policies or programs. This requires active participation not only from government institutions but also from non-governmental actors, including communities, the private sector, and Non-Governmental Organizations (NGOs).

To successfully implement Collaborative Governance, it is essential to identify and map the stakeholders involved in the collaboration. According to Schmeer, stakeholder mapping is critical for ensuring that public policy formulation does not result in overlapping interests. Stakeholder mapping also helps in understanding their experiences, motives, responsibilities, ethics, and knowledge regarding collaborative processes (Noor et al., 2022). Bormann and Golder emphasize that mapping actors in Collaborative Governance facilitates:

1) Recognizing the seriousness of stakeholders' interests in collaboration to guide decision-making.
2) Avoiding confrontations or negative consequences from policies or programs.
3) Building relationships and connections among stakeholders and anticipating process failures in collaboration (Bormann & Golder, 2013).

The principles outlined by Bormann and Golder highlight the importance of stakeholder mapping as the foundation for implementing a Collaborative Governance model (Bormann & Golder, 2013). Actor mapping ensures the inclusion of all relevant parties in the collaboration process, which directly impacts its overall effectiveness, as illustrated by Ansell and Gash's Collaborative Governance framework (Ansell & Gash, 2008).

The Collaborative Governance process framework, as developed by Ansell and Gash, comprises the following stages (Noor et al., 2022):

1) Starting Conditions
   This stage identifies two key issues—imbalances in resources among stakeholders and incentives for participation. If stakeholders lack balanced resources, powerful stakeholders may dominate the process. Thus, there must be a commitment to supporting weaker stakeholders. Additionally, incentives are necessary to encourage continued participation. Conflict anticipation and trust-building are also essential at this stage.

2) Facilitative Leadership
   Effective leadership is critical in Collaborative Governance. Leaders must foster interaction stability, build trust among stakeholders, ensure fairness, and facilitate productive discussions.

3) Institutional Design
   Clear and consistent rules, transparency, and realistic deadlines are fundamental to establishing an open institutional framework for collaboration.

4) Collaborative Process
   This stage involves face-to-face dialogue, mutual trust-building, shared commitment, and creating a shared understanding among stakeholders. The process should ultimately lead to consensus and problem-solving.

5) Intermediate Outcomes
   Successful collaboration is marked by continuous joint activities over a specific period, achieving shared goals efficiently and effectively. Although interim results may demonstrate progress, they should not be seen as the outcomes but rather as steps toward sustained success.

The framework is operationalized in **Table 1** below:

Table 1. Collaborative Governance Framework

No.	Dimensions of Collaborative Governance	Indicator
1	Initial Conditions	1) Imbalance in resources or power among stakeholders.
		2) Incentives for collaboration.
		3) History of conflict or cooperation among stakeholders.
2	Leadership	1) Leaders promote broad and active participation.
		2) Leaders ensure comprehensive influence and control.
		3) Leaders facilitate productive group dynamics.
		4) Leaders expand their scope of influence.
3	Institutional Design	1) Clear rules and guidelines are established.
		2) Consistency in institutional policies.
		3) Transparent processes for all stakeholders.
		4) Realistic deadline-setting.
4	Collaborative Process	1) Face-to-face dialogue among stakeholders.
		2) Mutual trust-building between stakeholders.
		3) Shared commitment in collaborative activities.
		4) Temporary successes were achieved during the process.
5	Results	1) Continuous joint activities over a specific period.
		2) Achievement of shared goals.

Source: Adopted and processed by researchers (2024).

2.2. Rabies and Mitigation Methods

Rabies is an acute infectious disease of the central nervous system caused by the rabies virus (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016). It is a zoonotic disease, meaning it is transmitted from animals to humans. The primary carriers of rabies are animals such as dogs, bats, cats, and monkeys. In Indonesia, rabies, commonly referred to as "mad dog disease," remains a significant public health concern (Direktorat Jenderal Pelayanan Kesehatan Kementerian Kesehatan Republik Indonesia, 2023). This disease is fatal, with a 100% mortality rate, and is caused by a virus that attacks the central nervous system in humans and other mammals. The virus is typically found in the saliva and nerve tissues (e.g., brain and nerve cells) of infected animals. It is most commonly transmitted through bites or scratches (World Health Organization, 2018).

The causative agent of rabies is a virus from the Lyssavirus genus, which belongs to the Rhabdoviridae family. This neurotropic virus has a bullet-like shape, measuring 130-300 nm in length and 70 nm in diameter. It consists of a single-stranded RNA (Ribo Nucleic Acid) core surrounded by a lipoprotein envelope. The virus's outer membrane is adorned with glycoprotein G, which is critical for inducing immunity through vaccination and identifying the

OPEN ACCESS

virus serologically (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016).

Rabies has a global presence, affecting nearly every continent except Antarctica. Over 150 countries report rabies cases, with annual fatalities exceeding 55,000 people. Additionally, more than 15 million people worldwide receive post-exposure prophylaxis (PEP) to prevent the disease's progression. Children under 15 years old account for 40% of those bitten by animals suspected of rabies (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016).

The first rabies case in Indonesia was documented in 1884 by Esser in a buffalo, followed by cases in dogs (1889) and humans (1894) reported by Pening and Eileris de Zhaan, respectively. All initial cases occurred in West Java Province before rabies spread to other regions (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016).

Globally, 99% of rabies deaths are caused by dog bites. In most developing countries, domestic dogs serve as the primary reservoir, while wild animals such as foxes, civets, and wild dogs act as reservoirs in certain regions. In Indonesia, 98% of human rabies cases are transmitted via dog bites. The incubation period for rabies ranges from two weeks to two years, typically lasting 3-8 weeks. According to the World Health Organization, the average incubation period is 30-90 days (World Health Organization, 2018). Factors influencing this period include:

1) The type or strain of the rabies virus.
2) The viral load was introduced.
3) The depth of the bite wound, with deeper wounds, increases the likelihood of the virus reaching the nervous system.
4) The proximity of the bite wound to the brain, as it bites closer to the brain, leads to faster symptom onset.
5) The immunity level of the affected individual.

2.2.1. Symptoms in Humans

Rabies in humans manifests in four stages (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016):

1) Prodromal Stage
   Initial symptoms include fever, weakness, lethargy, loss of appetite, insomnia, severe headaches, sore throat, and general discomfort.
2) Sensory Stage
   Symptoms progress to tingling or burning sensations at the bite site, heightened anxiety, and overreaction to sensory stimuli.
3) Excitation Stage
   Neurological disorders dominate this stage. Patients may appear confused restless, and experience hallucinations, phobias (e.g., hydrophobia, aerophobia, photophobia), muscle spasms, excessive salivation, and pupil dilation. Death usually occurs within seven days due to cardiac and respiratory failure.
4) Paralysis Stage
   This form of rabies accounts for 30% of cases and progresses slowly. Symptoms include gradual muscle paralysis starting at the bite site and eventual death due to respiratory and cardiac muscle paralysis.

2.2.2. Symptoms in Animals (Dogs)

Infected animals exhibit the following stages (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016):

1) Prodromal Stage (2-3 days)

Changes in behavior, such as avoiding their owner, heightened startle reflexes, and rebellion. Other signs include increased body temperature and pupil dilation.

2) Excitation Stage (3-7 days)

Symptoms include photophobia, restlessness, hallucinatory behaviors (e.g., snapping at imaginary objects), chewing inappropriate objects, and increased aggression. Paralysis of laryngeal and pharyngeal muscles causes hoarseness, difficulty swallowing, and excessive salivation.

3) Paralysis Stage

Paralysis of the jaw and hind limbs leads to the dragging of legs and choking-like sounds due to throat muscle paralysis.

2.2.3. Prevention of Rabies Transmission in Humans

Rabies prevention involves treating bite wounds from infected animals as follows (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016):

1) Wound Washing

Immediately wash the wound with soap under running water for 15 minutes to inactivate the virus. Avoid using tools that may cause additional injuries.

2) Antiseptic Application

Antiseptics such as povidone-iodine or 70% alcohol are applied to kill the remaining viruses around the wound.

3) Administration of Anti-Rabies Vaccine (VAR) and Anti-Rabies Serum (SAR)

VAR stimulates the immune response to neutralize the rabies virus. However, if the virus has already reached the central nervous system, vaccines are ineffective. Serum administration depends on the condition of the bite, observations of the biting animal, and laboratory results.

3. Research Methodology

The research method employed in this study is descriptive qualitative, chosen for its ability to provide an in-depth explanation of the analysis. According to Sugiyono, descriptive qualitative research is a method used to study natural objects, where the researcher serves as the key instrument (Sugiyono, 2002). Descriptive research is a widely used and well-established method in social sciences, as many social studies inherently involve describing phenomena. This method aims to describe, explain, and answer research questions comprehensively by analyzing the observed phenomena in detail.

Data collection was conducted using triangulation techniques, combining observation, interviews, and documentation. Observations involved direct examination of the implemented Collaborative Governance processes to gain a holistic understanding of the social context (Sugiyono, 2002). Interviews, as a data collection technique, were conducted using structured questions posed verbally to research subjects (Rosady, 2010). These interviews targeted multiple informants to gather relevant data on the Collaborative Governance process for managing rabies in TTU Regency. Documentation involved collecting data and information from records related to Collaborative Governance activities.

3.1. Data Sources

This study utilized informants and documents as primary data sources. Informants were identified using the Snowball Sampling technique, defined by Sugiyono as a method that begins with a small sample and gradually expands (Amin et al., 2023). This approach was chosen due to the limited initial information available about the individuals responsible for rabies management in the TTU Regency. Sampling was conducted progressively, with researchers identifying key informants and then expanding the sample based on data from previous participants. Meanwhile, documents such as scientific journals, literature studies, and relevant records were used as supporting data to complement the research findings.

3.2. Data Analysis

Data collected were analyzed through three stages: data reduction, data presentation, and conclusion (Sutopo, 2002).

1) Data Reduction

This process involved selecting, focusing, simplifying, and abstracting data from field notes. The study prioritized classifying raw data from sources, eliminating irrelevant information, and concentrating on data aligned with the research objectives. This reduction process was iterative and continued throughout the study.

2) Data Presentation

The presentation phase structured data into logically and systematically arranged narratives. These narratives enabled easy understanding of the phenomena and provided a foundation for further analysis or action. In this study, data presentation focused on answering the formulated research questions with detailed descriptions.

3) Drawing Conclusions

Conclusions were derived by grouping data into identifiable patterns, which helped explain the realities surrounding the research problem. These conclusions were verified to ensure their validity and reliability (Sutopo, 2002).

4. Results and Discussion

This study employs the Collaborative Governance process framework proposed by Ansell and Gash, which provides a comprehensive approach to analyzing stakeholder collaboration in addressing public issues (Ansell & Gash, 2008). The results and discussion are organized according to the key stages of the framework, with descriptive analyses and in-depth explanations of findings supported by evidence and references.

4.1. Starting Conditions

The starting conditions stage examines the foundational factors influencing the implementation of Collaborative Governance, focusing on the rationale for collaboration, resource availability, and stakeholder incentives.

4.1.1. Background of Collaborative Governance Implementation

The need for Collaborative Governance in managing rabies in the North Central Timor (TTU) Regency stems from the zoonotic nature of the disease, which involves transmission from infected animals (e.g., dogs, bats, cats, monkeys) to humans (World Health Organization, 2018). Rabies is categorized as a non-natural disaster due to its unpredictable occurrence. It necessitates a multi-stakeholder approach to control efforts (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016).

To address this, the TTU government established an Emergency Command Post for Rabies Outbreak Management through Regent's Decree No. 106/KEP/HK/III/2024. This command post coordinates efforts among government agencies, private sector entities, and the community to ensure comprehensive and structured management of rabies. The formation of this institutional framework highlights the government's recognition of the need for integrated collaboration to tackle a multifaceted public health issue (Noor et al., 2022).

4.1.2. Overview of Stakeholder Resources

Resource availability is critical in Collaborative Governance, as uneven distribution can impede effective collaboration (Ansell & Gash, 2008). Rabies control in TTU is managed by the Regional Disaster Management Agency (BPBD), which oversees financial resources allocated through unexpected costs. However, additional resources such as human capital, vaccines, and operational facilities are managed by specific agencies involved in the command post.

The command post's structure includes:

1) Regional Disaster Management Agency (BPBD)
   Secretariat and main coordinator.
2) Health Service
   Responsible for human vaccinations and treatment.
3) Animal Husbandry Service
   Manages animal vaccinations and rabies-transmitting animal surveillance.
4) Communication, Informatics, and Statistics Service
   Conduct community education campaigns.

Despite this structured involvement, disparities in resource allocation and operational capacity among stakeholders present challenges. For instance, interviews revealed that human resource shortages in some working groups limited the execution of planned activities. Effective mapping of resources and aligning responsibilities with each agency's expertise are necessary to mitigate these challenges (Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik, 2016).

4.1.3. Incentives for Stakeholder Participation

Incentives play a crucial role in sustaining stakeholder participation. Operational costs, including stakeholder incentives, are derived from BPBD's unexpected cost budget. However, variations in incentive procedures among agencies, such as differences between the BPBD, Health Service, and Animal Husbandry Service, have led to conflicts. For instance, some agencies faced delays in receiving incentives due to differing administrative procedures. Coordination meetings were held to address these conflicts, but inconsistencies remain a barrier to seamless collaboration (Amin et al., 2023).

4.2. Facilitative Leadership

Leadership is essential for fostering trust, ensuring accountability, and coordinating activities in Collaborative Governance (Ansell & Gash, 2008). In the TTU Regency, leadership within the Rabies Control Command Post was found to be effective, characterized by regular coordination meetings and strategic direction provided by the command post coordinator.

The coordinator facilitated monthly meetings, where stakeholders discussed progress, evaluated activities, and planned future efforts. Additionally, the coordinator leveraged digital communication platforms, such as WhatsApp, to maintain continuous communication among

working groups. Evidence from interviews indicated that this leadership approach improved stakeholder alignment and expedited decision-making processes (Noor et al., 2022).

Moreover, the command post leadership established partnerships with external organizations, such as the Australia Indonesia Health Security Partnership (AIHSP), to provide technical support and community education. This reflects the proactive role of leadership in mobilizing resources beyond local government capacities.

4.3. Institutional Design

Institutional design refers to the formal structures and rules that guide collaboration among stakeholders (Ansell & Gash, 2008). The TTU Regency Rabies Control Command Post serves as the institutional framework for rabies management. The Regent's Decree outlines the roles and responsibilities of participating agencies, including:

1) Regional Disaster Management Agency (BPBD)
   Secretariat and operational coordinator.
2) Health Service
   Manages human vaccination and treatment.
3) Animal Husbandry Service
   Oversees animal vaccination and surveillance.
4) Communication and Information Service
   Conducts public awareness campaigns.

While this structure provides clarity and direction, interviews revealed gaps in implementing joint activities due to a lack of shared operational guidelines. For instance, the absence of a standardized framework for integrating activities among working groups hindered coordination and led to siloed efforts.

4.4. Collaborative Process

The collaborative process involves fostering trust, mutual understanding, and commitment among stakeholders. In TTU Regency, monthly face-to-face dialogues were held to align goals and evaluate progress. These meetings facilitated information sharing and consensus-building, resulting in improved coordination among stakeholders (Ansell & Gash, 2008).

Despite these efforts, joint activities were limited, with most technical tasks carried out independently by individual working groups. For example, the Animal Husbandry Service conducted vaccination campaigns without significant input from other stakeholders. This lack of integration highlights the need for more collaborative joint activities, as emphasized in the Collaborative Governance framework.

4.5. Intermediate Outcomes

Intermediate outcomes reflect the tangible results achieved through collaboration. In TTU Regency, the implementation of Collaborative Governance led to a reduction in rabies cases, as evidenced by health department reports. However, the lack of sustained joint activities among working groups suggests that these outcomes remain temporary rather than systemic.

Interviews revealed that stakeholders viewed monthly coordination meetings as valuable for aligning strategies but insufficient for addressing operational gaps. The need for ongoing joint initiatives and long-term planning was identified as critical for ensuring the sustainability of rabies control efforts.

5. Conclusion

This study concludes that the implementation of Collaborative Governance by the North Central Timor (TTU) Regency Government has been effective in certain aspects but remains suboptimal overall. Using the framework proposed by Ansell and Gash, which consists of five stages—Starting Conditions, Facilitative Leadership, Institutional Design, Collaborative Process, and Intermediate Outcomes—the findings highlight both strengths and areas requiring improvement.

Key indicators such as facilitative leadership, institutional design, and collaborative processes have been implemented adequately, fostering coordination and alignment among stakeholders. However, two critical gaps were identified. First, under the Starting Conditions stage, discrepancies in understanding and administering incentives among stakeholders have created potential conflicts, undermining collaboration. Second, under the Intermediate Outcomes stage, the lack of robust and sustained joint activities has limited the achievement of comprehensive results, particularly in efforts to reduce the spread of rabies in the TTU Regency area.

To enhance the effectiveness of Collaborative Governance, it is recommended that the TTU Regency Government addresses technical issues related to incentive distribution. A shared agreement among all stakeholders regarding incentive mechanisms is crucial to minimize conflicts and ensure smooth collaboration. Additionally, the design and implementation of joint activities involving all relevant agencies and stakeholders are imperative to accelerate progress toward the goals of rabies prevention and control.

6. Acknowledgment

7. Declaration of Conflicting Interests

The authors have declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

References

Abdulai, I. A., Fuseini, M. N., & File, D. J. M. B. (2024). Making cities clean with collaborative governance of solid waste infrastructure in Ghana. *Cleaner Waste Systems*, *8*, 100150. https://doi.org/10.1016/j.clwas.2024.100150

Amin, N. F., Garancang, S., & Abunawas, K. (2023). Konsep umum populasi dan sampel dalam penelitian. *JURNAL PILAR: Jurnal Kajian Islam Kontemporer*, *14*(1), 15–31.

Ansell, C., & Gash, A. (2008). Collaborative Governance in Theory and Practice. *Journal of Public Administration Research and Theory*, *18*(4), 543–571. https://doi.org/10.1093/jopart/mum032

Arrozaaq, D. L. C. (2016). *Collaborative Governance (Studi Tentang Kolaborasi Antar Stakeholders Dalam Pengembangan Kawasan Minapolitan di Kabupaten Sidoarjo)* [Universitas Airlangga]. http://repository.unair.ac.id/67685/

BBC News Indonesia. (2023). *Kasus rabies di NTT berpotensi jadi "wabah yang besar" hingga Timor Leste, kata ahli*. https://www.bbc.com/indonesia/articles/cl4dnydx254o

Bormann, N.-C., & Golder, M. (2013). Democratic Electoral Systems around the world, 1946–2011. *Electoral Studies*, 32(2), 360–369. https://doi.org/10.1016/j.electstud.2013.01.005

Dinas Kesehatan Kabupaten Timor Tengah Utara. (2024). *Update Harian Kasus Gigitan Hewan Penular Rabies di Kabupaten TTU (13 Januari 2024)*.

Direktorat Jenderal Pelayanan Kesehatan Kementerian Kesehatan Republik Indonesia. (2023). *Mengenal Penyakit Rabies*. https://yankes.kemkes.go.id/view_artikel/2531/mengenal-penyakit-rabies

Direktorat Pencegahan dan Pengendalian Penyakit Tular Vektor dan Zoonotik. (2016). *Buku Saku Petunjuk Teknis Penatalaksanaan Kasus Gigitan Hewan Penular Rabies Di Indonesia*. Kementerian Kesehatan Republik Indonesia.

Kompas.com. (2023). *Satu Lagi Warga TTU Meninggal Dunia akibat Rabies*. https://regional.kompas.com/read/2023/11/22/170936778/satu-lagi-warga-ttu-meninggal-dunia-akibat-rabies

Lembaga Penyiaran Publik Radio Republik Indonesia. (2023). *Dua Ekor Anjing di Kabupaten TTU Resmi positif Rabies*. https://www.rri.co.id/daerah/481414/dua-ekor-anjing-di-kabupaten-ttu-resmi-positif-rabies

Media Indonesia. (2023). *Rabies Merebak di Timor Tengah Utara, Total 178 Korban, 1 Meninggal*. https://mediaindonesia.com/nusantara/630857/rabies-merebak-di-timor-tengah-utara-total-178-korban-1-meninggal

Noor, M., Falih, S., & Antun, M. (2022). *COLLABORATIVE GOVERNANCE: Suatu Tinjauan Teoritis dan Praktis*. Bildung Nusantara.

O'Flynn, J., & Wanna, J. (2008). *Collaborative Governance New Era of Public Policy in Australia*. ANU Press.

Pitriyanti, S., Dawud, J., & Abdullah, S. (2022). Strategi Peningkatan Kualitas Pelayanan Administrasi Umum di Kelurahan Pasirjati Kecamatan Ujungberung Kota Bandung. *Jurnal Media Administrasi Terapan*, 3(1), 73–89. https://doi.org/10.31113/jmat.v3i1.40

Puspaningtyas, A. (2022). *Collaborative Governance: Sebuah Paradigma?* https://publik.untag-sby.ac.id/berita-430-collaborative-governance-sebuah-paradigma.html

Rosady, R. (2010). *Metode Penellitian Public Relation dan Komunikasi*. Rajawali Press.

Sandy, O. F. (2020). Analisis Peran Aktor dalam Implementasi Kebijakan Pembangunan Sanitasi di Kabupaten Probolinggo. *Jurnal Ilmiah Administrasi Publik*, 6(3), 415–422. https://doi.org/10.21776/ub.jiap.2020.006.03.10

Siagian, S. P. (2005). *Administrasi Pembangunan Konsep, Dimensi, dan Strateginya*. Bumi Aksara.

Sugiyono. (2002). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Alfabeta.

Sutopo. (2002). *Metodologi Penelitian Kualitatif: Dasar dan Terapannya Dalam Penelitian*. UNS Press.

VictoryNews. (2023). *Kasus Rabies Merebak di TTU, Pemerintah Belum Tetapkan Status KLB*. https://www.victorynews.id/ntt/33110941445/kasus-rabies-merebak-di-ttu-pemerintah-belum-tetapkan-status-klb

World Health Organization. (2018). *WHO Expert Consultation on Rabies: WHO TRS N°1012*. https://www.who.int/publications/i/item/WHO-TRS-1012

About the Authors

1) **Hendrikus Hironimus Botha** obtained his Master's degree from Sebelas Maret University, Indonesia, in 2018. The author is an Assistant Professor at the Department of Public Administration, Faculty of Social and Political Sciences, University of Timor, Indonesia.
   E-Mail: hendrabotha@gmail.com

2) **Yohanes Imanuel Naif** obtained his Master's degree from Sekolah Tinggi Pembangunan Masyarakat Desa APMD, Indonesia, in 2015. The author is an Assistant Professor at the Department of Government Studies, Faculty of Social and Political Sciences, University of Timor, Indonesia.
   E-Mail: imanuelnaif89@gmail.com

3) **Pionisius Minggu** obtained his Master's degree from Universitas Merdeka Malang, Indonesia, in 2016. The author is an Assistant Professor at the Department of Public Administration, Faculty of Social and Political Sciences, University of Timor, Indonesia.
   E-Mail: s2pionisiusminggu@gmail.com

OPEN ACCESS