

Development of integrated village fund governance model with siberas public service application

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Abstract: This study introduces a comprehensive governance model designed to enhance the management of village funds in Indonesia. This model combines the Rais-MR3 system with the SIBERAS public service application. Village funds, established under Village Law No. 6 of 2014, are critical in advancing rural development. Nevertheless, challenges such as inefficiency, risks of corruption, lack of transparency, and limited public involvement have obstructed their effective management. This research aims to tackle these issues by creating a more robust governance framework that improves the efficiency and accountability of village fund management. Employing a qualitative approach, this research examines three case studies: the villages of Kalempang, Sipodeceng, and Bina Baru. Data collection methods included focus group discussions, in-depth interviews, and participatory observations, which provided detailed insights into the dynamics of village governance. The study's findings indicate that integrating digital governance tools, like the SIBERAS application, with the Rais-MR3 model substantially enhances administrative processes, boosts transparency and accountability, and diminishes corruption risks. Moreover, the model promotes increased public participation in decision-making, essential for achieving good governance. This research adds to the expanding body of literature on digital governance in rural environments by presenting a scalable governance model that other villages throughout Indonesia can adopt. The practical implications of the model suggest that its implementation may result in more effective service delivery, improved governance practices, and enhanced public trust—elements critical for sustainable rural development. Besides, the study emphasizes the importance of using technology to overcome governance challenges, providing a framework for other villages to improve transparency, accountability, and public engagement.

Keywords: *Accountability, Model development, Public participation, Transparency, Village fund.*

1. Introduction

The governance of village funds is essential for promoting sustainable rural development, especially within Indonesia's decentralized government framework [1]. Village funds, established under the Village Law (No. 6 of 2014), have played a critical role in meeting local needs, improving public services, and stimulating economic growth in rural areas [2]. Even with this, effective governance of these funds is a significant challenge, as numerous villages face transparency, accountability, and resource management issues [3]. To address these challenges, developing an integrated governance model for village funds is essential to ensure they are managed efficiently and effectively.

This study examines the integration of the Siberas Public Service Application, a digital platform intended to improve public service delivery and financial transparency in the governance of village

funds [4]. By using information and communication technology (ICT), the Siberas application seeks to enhance governance processes, simplify administrative tasks, and encourage greater public involvement in monitoring and assessing using village funds [5]. Incorporating such digital solutions marks an important transition towards more transparent, accountable, and comprehensive governance practices [5]. This paper aims to create a model that integrates the Siberas Public Service Application into village fund governance, providing insights on how technology can help tackle critical governance challenges while contributing to the overarching goals of rural development and good governance in Indonesia.

The village fund (VF) program launched by the government since 2015 amounted to Rp20.67 trillion and continues to increase, every year [6], in 2023 it will be 70 trillion. The increase in the budget aims to improve the welfare of the village community [7]. However, there is the potential for irregularities in the field. Findings from the Corruption Eradication Commission (KPK), that there are a number of problems in the management of village fund. In general, village fund irregularities are carried out in the form of budget abuse, and abuse of authority [8]. Village fund management is expected to be managed in accordance with law 6 of 2014 concerning villages article 20, Permendagri 113 of 2014 concerning village finance article 2 (1), that "Village finance is managed based on the principles of transparency, accountability, and participation" [9], [10],[11] Management should consider risk management so that there is a prudent process in its use [12].

The research surrounding village fund management in Indonesia has explored various dimensions, ranging from the effectiveness of fund utilization to governance and risk management. A study by B. G. Siregar et. al [7] 2024 assessed the village fund program's role in empowering communities and improving welfare, concluding that fund management in developed villages has been well managed. This is complemented by research from R. E. Diansari et. al [9] in 2023, which explored the influence of prosocial behavior on village fund accountability, highlighting that organizational commitment and competence are critical factors in ensuring effective management. Risk management in village fund administration has also been examined in a 2023 study by A. H. Ginting et. al [12], demonstrating that proper risk management practices can enhance accountability and resource efficiency. Meanwhile, governance issues in village fund management were addressed by M. Rais Rahmat Razak and M. Sailan [13] in 2022, where accountability, transparency, and public participation were limited to technical aspects, calling for a more comprehensive approach that includes moral considerations and community involvement. Lastly, the 2023 study by A. Riska Andreani Syafaruddin [14] on the digitalization of village governance through the SIBERAS application indicated that village officials are increasingly proficient in using this application, which supports their administrative roles. These studies underscore the need for a multifaceted approach to village fund management, emphasizing technical proficiency and deeper engagement with governance principles.

The theme of research on Village Funds is still very rare, so the contribution of this research is very meaningful in the development of science. Data processing with the help of the VOSviewer application on 700 papers in the last 10 years from reputable international journals, it was concluded that research on village fund governance based on the principles of accountability, transparency and public participation at the same time has not been found, but those that discuss related to the principles separately exist, and are rarely as shown in Figure 1.

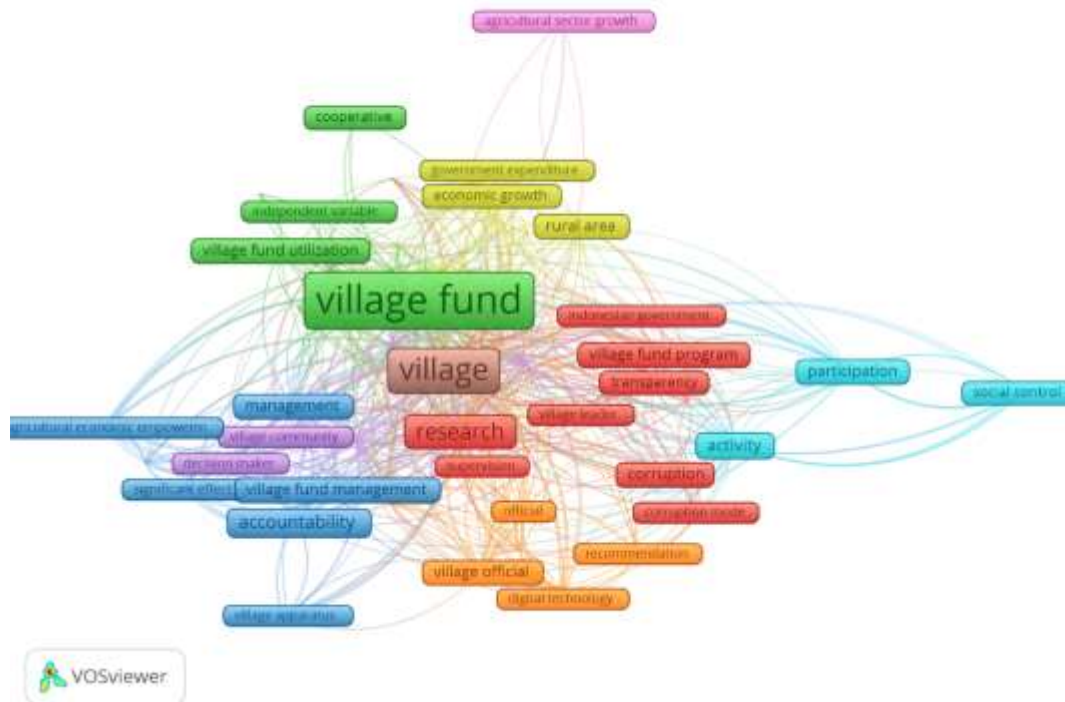


Figure 1.
Network Visualization 2021-2024.

Das Sein of this study, observes, the village fund management model researched in 2022 at the State University of Makassar, with novelty in the form of the Rais-MR3 model. This model provides an overview of village fund governance based on the principles of accountability, transparency and public participation, with an emphasis on morality, access and questionnaires [13], [15], [16].

This study's central research question is: How can the Rais-MR3 governance model be effectively integrated into the Siberas application to enhance transparency, accountability, and public participation in village fund management? This research adopts a qualitative approach using descriptive-explanatory methods to provide an in-depth analysis of the integration process across three village case studies: Kalemang, Sipodeceng, and Bina Baru. Data were collected through focus group discussions (FGDs), in-depth interviews, and participatory observation, supplemented by digital tools such as NVivo for thematic analysis. The contribution of this research lies in its practical and theoretical implications. It offers a scalable governance model that integrates technology into village fund management, addressing operational inefficiencies and governance challenges. Theoretically, it enriches the discourse on rural digital governance by providing empirical evidence of how cyber applications can transform public service delivery in village settings. This integration is expected to increase community involvement, reduce corruption risks, and strengthen local governance frameworks, contributing to sustainable rural development.

2. Methods

This research adopts a qualitative approach with an explanatory descriptive design [17]. This method was chosen to thoroughly understand the topic by closely examining the experiences, behaviors, and viewpoints of the participants [18]. The study uses in-depth interviews, focus group discussions,

and observations to provide a comprehensive portrayal of the phenomenon and to clarify the underlying causes and processes [19]. Through a reflective analysis process, the research aims to identify patterns and themes, offering a detailed account and explanation of the key factors that influence the outcomes [20]. This methodology not only seeks to collect rich, contextual information but also emphasizes flexibility, allowing the study to adjust as new insights arise, thus enhancing the understanding of the phenomenon being investigated.

Qualitative research with the type of Descriptive Explanatory, which will look at the management of Village Funds that can be integrated with the Siberas application or other applications in the Village. By taking 3 village loci in Sidrap Regency; Kalempang Village, Sipodeceng Village, Bina Baru Village. The first step in this study is the socialization and implementation of Focus Group Discussions (FGD) with related parties in three villages. At this stage, a manual participation questionnaire will be used to obtain initial information from stakeholders. Furthermore, data collection was carried out and continued with an analysis of village conditions, integrating the Rais-MR3 model with the Siberas application.

The evaluation of the process is carried out after the data analysis stage, to determine whether the method used is working well. If the process goes well (according to the expected method), a closing FGD will be held to conclude the research results. If the method does not work well (NG or "not OK"), the study will return to the analysis stage for evaluation and improvement of the method. The key components of this model include analyzing conditions, effectiveness, ease of use, and identifying any obstacles that may arise during the implementation process. With the integration with the Siberas application, village fund governance is expected to become more transparent, accountable, and easy to use for implementers in the village.

The next research plan involves data commissioning and ensuring that this model can be used easily. Researchers will also conduct follow-up on the implementation of this model to ensure that the integration of Siberas is running well and that obstacles that arise can be overcome immediately. As a final result, this research will produce a final report containing conclusions and recommendations for improving technology-based village fund governance, which is expected to be applied to other villages. Thus, the development of the Rais-MR3 model has the potential to make a significant contribution to increasing the effectiveness and efficiency of village fund management in Indonesia. The Figure 2 shows the process of the Research Stages in a structured manner.

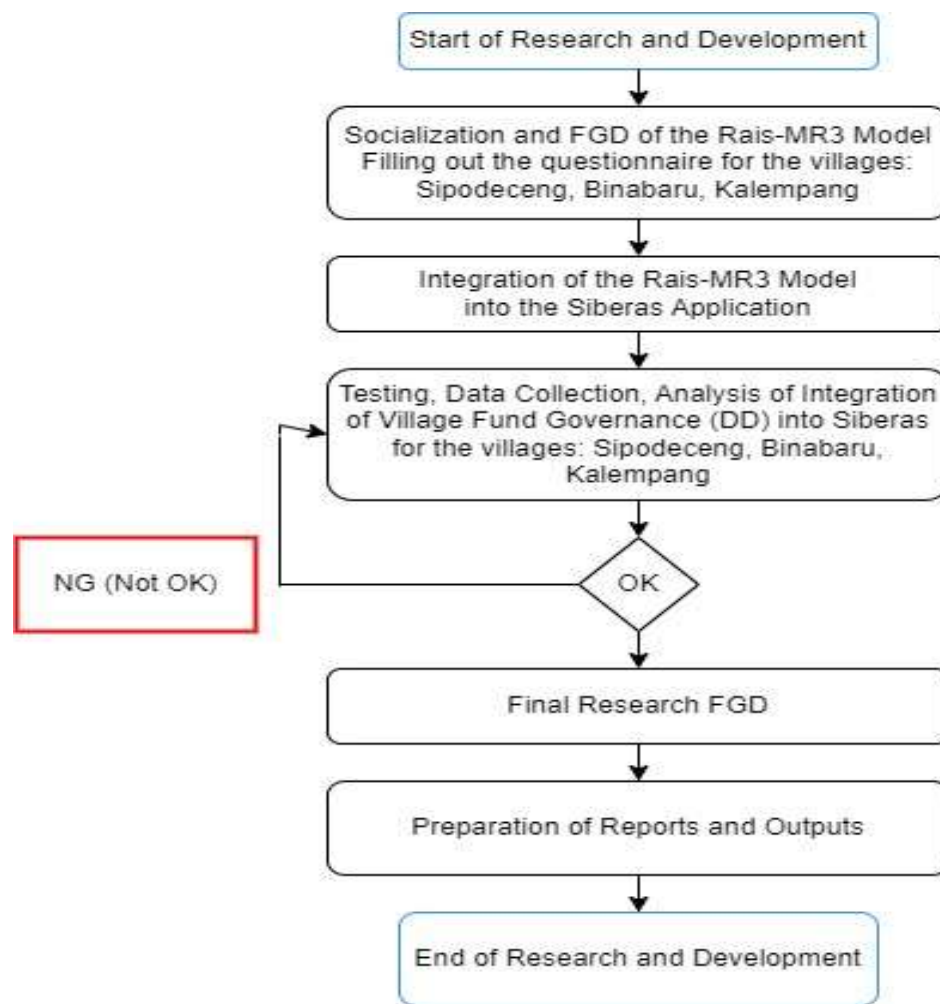


Figure 2.
Flow chart of research stages.

3. Result and Discussion

3.1. Global Insights in Village Fund Governance Research

The Figure 3 diagram presented depicts the interrelation between various key terms (DE: Descriptors) and their associations with authors (AU) and corresponding countries (AU_CO), forming a comprehensive mapping of research contributions in the area of village funds, poverty alleviation and governance. The data showcases the multidisciplinary engagement on topics such as accountability, village funds, and the role of technology in economic empowerment, particularly in Indonesia. The authors involved, including Wardhana IW, Cipriani D, and Abdullah MW, highlight a diverse contribution spectrum from different regions, with a notable dominance of researchers from Indonesia [21],[22]. The linkage between "village fund" and "accountability" underscores the central theme of governance and fiscal responsibility within rural development frameworks. This connectivity is vital as it underlines the pivotal role of village funds in alleviating poverty through transparent and accountable fund management, a concern heavily discussed by authors like Budiati Y and Aulia F [23], [24].

Moreover, international contributions, such as those from Poland and Spain, represented by Feltynowski M and Bayan AYM, offer a comparative perspective on rural governance models, adding depth to the ongoing discourse. Including bibliometric analysis further enriches the research, providing a meta-analytical approach to assessing publication trends, authorship networks, and thematic focus

over time. In summary, the diagram underscores a critical intersection of governance, accountability, and economic empowerment in village fund research, with solid representation from Indonesian scholars and contributions from international researchers, enhancing the global discourse on sustainable rural development. The focus on accountability, public participation, and transparency highlights the pressing need for effective governance frameworks in managing village funds, particularly relevant for poverty alleviation efforts across developing regions.

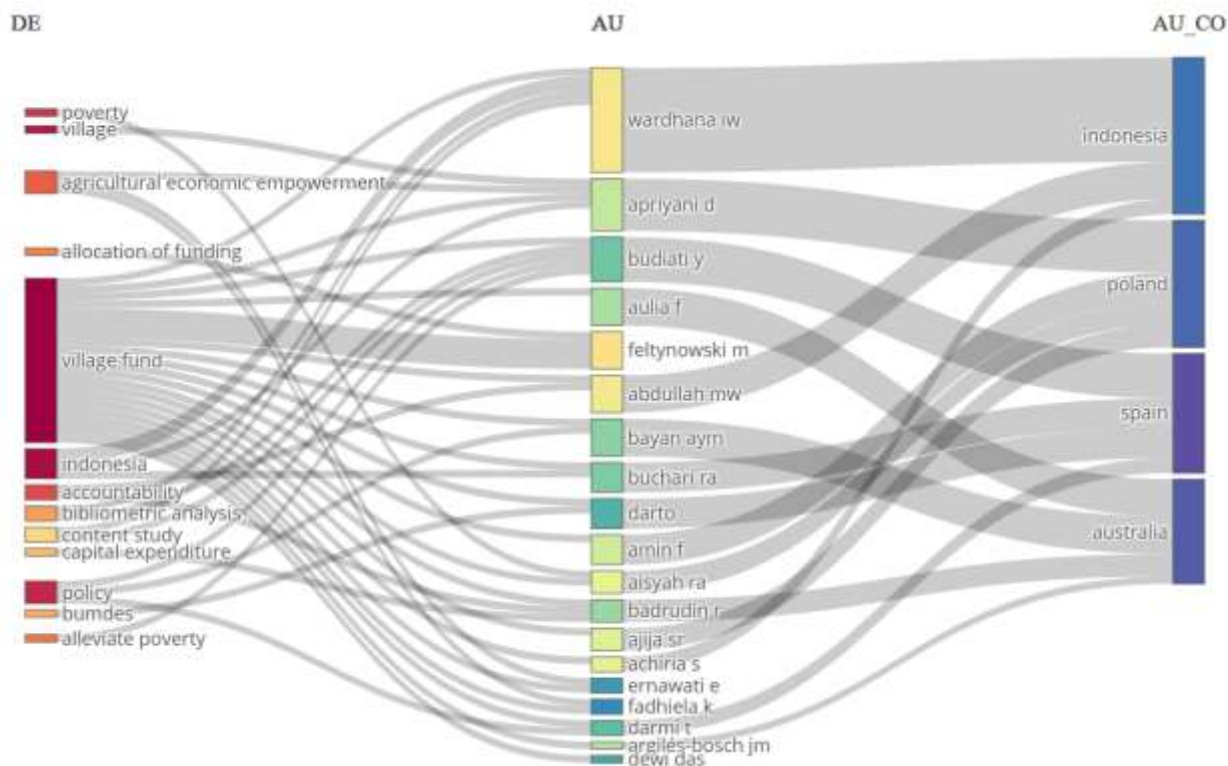


Figure 3. Research themes and author affiliations in village fund governance studies.

3.2. Most cited documents in the Village Fund Governance theme

Based on the provided table, the collection of papers presents a diverse range of topics and research areas, with various degrees of academic impact as indicated by total citations (TC), total citations per year (TCY), and normalized total citations (NTC). The most cited paper by Permatasari P (2021) in the journal Sustainability demonstrates significant academic influence with 24 total citations, a TCY of 6.00, and an NTC of 2.67, reflecting its relevance and ongoing contribution to sustainability studies. On the other hand, Madyan M (2020) and Suandi (2022), both published in Int J Innov Creat Change and Sustainability, respectively, exhibit lower citation counts, which may reflect either recent publication dates or niche focus areas that require further academic exploration and recognition. Notably, the paper by Putri Cm (2024) in J Financ Crime stands out with a high TCY of 7.00 and NTC of 4.67, suggesting that despite its recent publication, it is quickly gaining traction and proving valuable in financial crime research. Similarly, the work by Nugroho A (2022) in Int J Disaster Risk Reduct displays an NTC of 3.29, showcasing its relevance in disaster risk reduction. While some articles, such as those by Feltynowski M (2020) and Putra Rr (2022), have relatively modest citation counts, their inclusion in reputable journals such as Bull Geogr Socio-Econ Ser and J Appl Eng Technol Sci highlights the interdisciplinary nature of the research and its potential long-term impact. The range of topics, from

sustainability and innovation to financial crime and disaster risk, illustrates a well-rounded body of research contributing to various fields with differing but valuable academic impacts. Further citations may accumulate as these works are referenced and applied in theoretical and practical contexts.

Table 1.

Top 10 citation metrics of selected academic papers from Scopus.

No	Paper	DOI	TC	TCY	NTC
1	Permatasari P, 2021, Sustainability	10.3390/su132112294	24	6.00	2.67
2	Ernawati E, 2021, Economies	10.3390/economies9040164	10	2.50	1.11
3	Syafingi Hm, 2020, J Crit Rev	10.31838/jcr.07.07.103	9	1.80	1.50
4	Nugroho A, 2022, Int J Disaster Risk Reduct	10.1016/j.ijdr.2021.102768	8	2.67	3.29
5	Putri Cm, 2024, J Financ Crime	10.1108/JFC-11-2022-0266	7	7.00	4.67
6	Feltynowski M, 2020, Bull Geogr Socio-Econ Ser	10.2478/bog-2020-0030	6	1.20	1.00
7	Putra Rr, 2022, J Appl Eng Technol Sci	10.37385/jaets.v3i2.681	4	1.33	1.65
8	Madyan M, 2020, Int J Innov Creat Change		3	0.60	0.50
9	Sihombing T, 2024, J Infrastruct Policy Dev	10.24294/jipd.v8i4.3444	2	2.00	1.33
10	Suandi, 2022, Sustainability	10.3390/su142215244	2	0.67	0.82

3.3. Integrated Governance of Village Funds in Permendagri 113/2014

The development of village fund Governance that has been integrated into the application can be easily applied in every village that already has a public service application such as Siberas in Mario Village [14] and Malalin Village [25]. so that the management function in village fund management can be in accordance with the theory and this is the affirmation of the state of the art of this research. The instrument of applying the principles of accountability, transparency and public participation is easy to do and guaranteed to be more valid because it is run by the existing application system in the village and developed with the integration of the Rais-MR3 model with existing applications. [13], [26]. [25]. The idea of this study was developed with the State of The Art to obtain model development by looking at previous research that has been conducted related to village fund Governance and the use of information technology which is very useful in the context of developing a model that is integrated with cyber applications. The conceptual framework in the form of Fish Bone is to make it easier to understand this research.

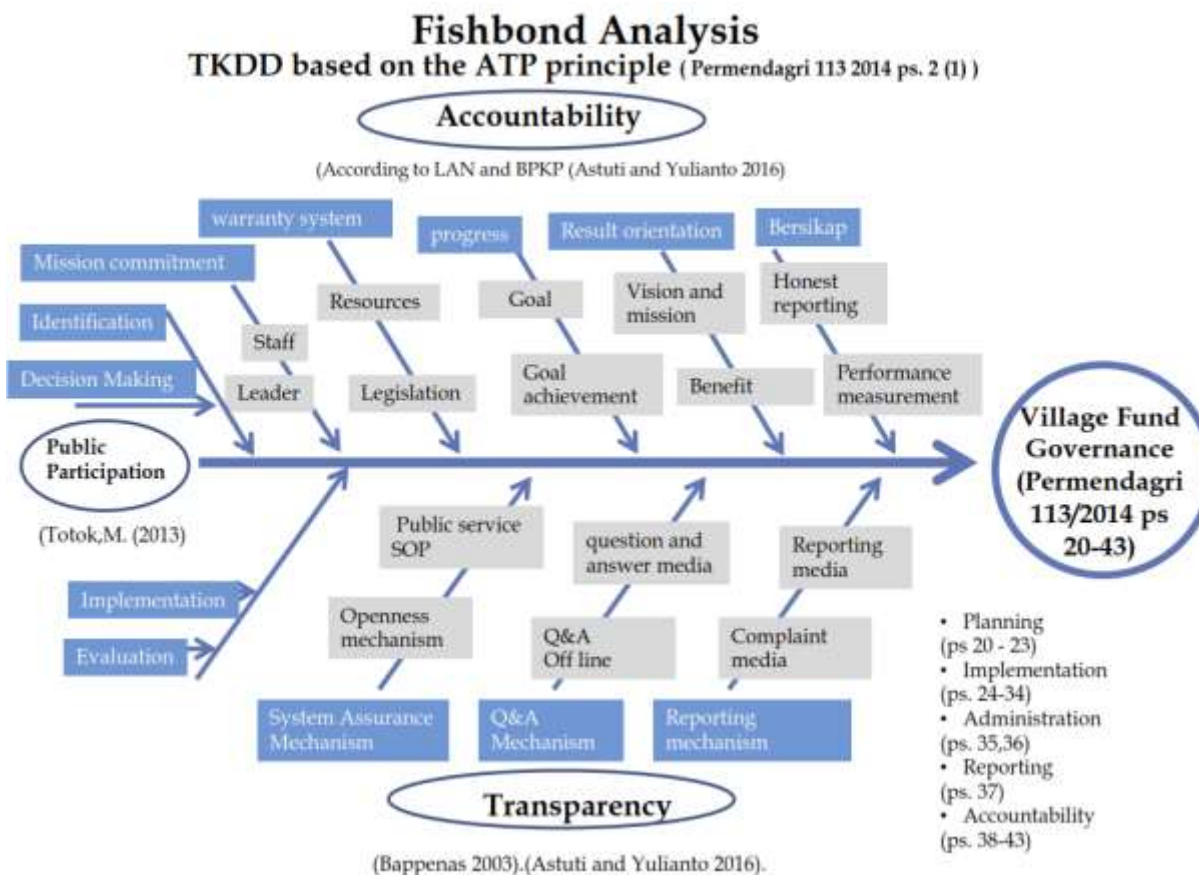


Figure 4.
Fishbobod analysis conceptual diagram.

3.4. Roadmap for Rural Governance: Accountability, Transparency, and ICT Integration

The research roadmap depicted in the image 5 illustrates a comprehensive strategy for advancing village fund governance, focusing on critical areas such as accountability, transparency, and the application of information technology [27]. The roadmap is structured into distinct phases, beginning with foundational research conducted before 2022, which explored the implementation of sound governance principles, including the role of child social welfare institutions and village-owned enterprises in enhancing rural governance. The subsequent phase (2022-2024) emphasizes applied research on integrating digital governance platforms like Siberas to enhance accountability, public participation, and transparency in village fund management [12]. The roadmap also outlines future applications (2025-2029) to expand successful governance models to other villages and establish strategic partnerships. By prioritizing the use of ICT in transforming regional governance, the research plan aligns with the broader goals of socio-cultural development and rural sustainability. This systematic approach addresses critical governance challenges and contributes to the ongoing discourse on leveraging technology for improved public service delivery in rural communities, making it highly relevant to current global efforts in rural development and governance reforms [28].

Research Road Map

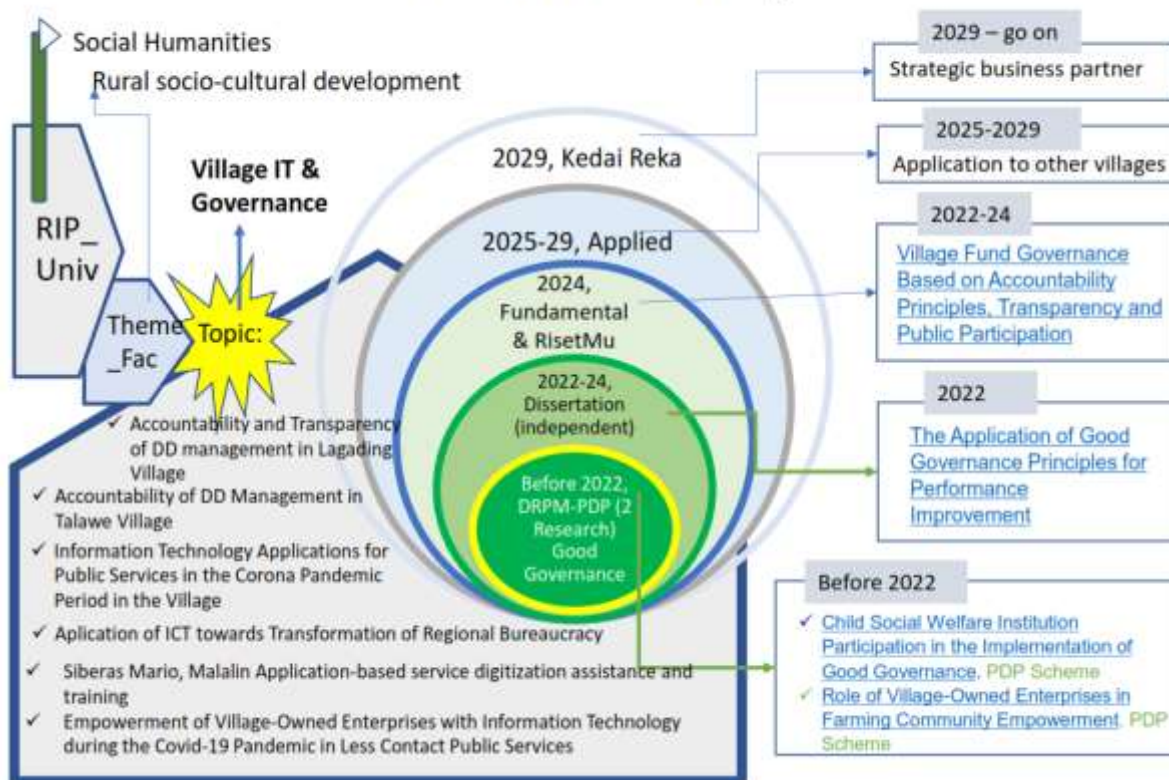


Figure 5.
Razak research road Map, MRR 2023.

3.5. Development of VILLAGE FUND Governance, integration of the Rais-MR3 Model With the "Siberas" Application.

The diagram presents a comparative analysis of three governance principles, accountability, public participation, and transparency, across the villages of Bina Baru, Kalempang, and Sipodeceng. The data shows different levels of emphasis on each governance dimension, with Bina Baru demonstrating a strong focus on public participation, accounting for nearly 40%. This signifies the community's active involvement in the decision-making process. However, this intense focus on participation contrasts with a relatively lower attention to accountability and transparency. This suggests a potential need to enhance governance mechanisms related to responsible leadership and open communication.

Consequently, while community involvement is evident, there may be gaps in guaranteeing that governance processes remain transparent and that leaders are held accountable. In contrast, Kalempang reflects a more balanced approach, with accountability at 40% and public participation at 35%, while transparency receives slightly less emphasis. This balanced allocation emphasizes Kalempang's commitment to holding governance leaders accountable to the public while promoting community involvement. Sipodeceng, on the other hand, places a higher emphasis on accountability at around 35% but pays less attention to public participation and transparency. The lower focus on transparency across all three villages indicates that improving open governance is a significant challenge. Overall, this analysis offers valuable insights into the diverse governance challenges and priorities present within these rural communities, emphasizing needing customized strategies to enhance transparency, accountability, and community participation in local governance.

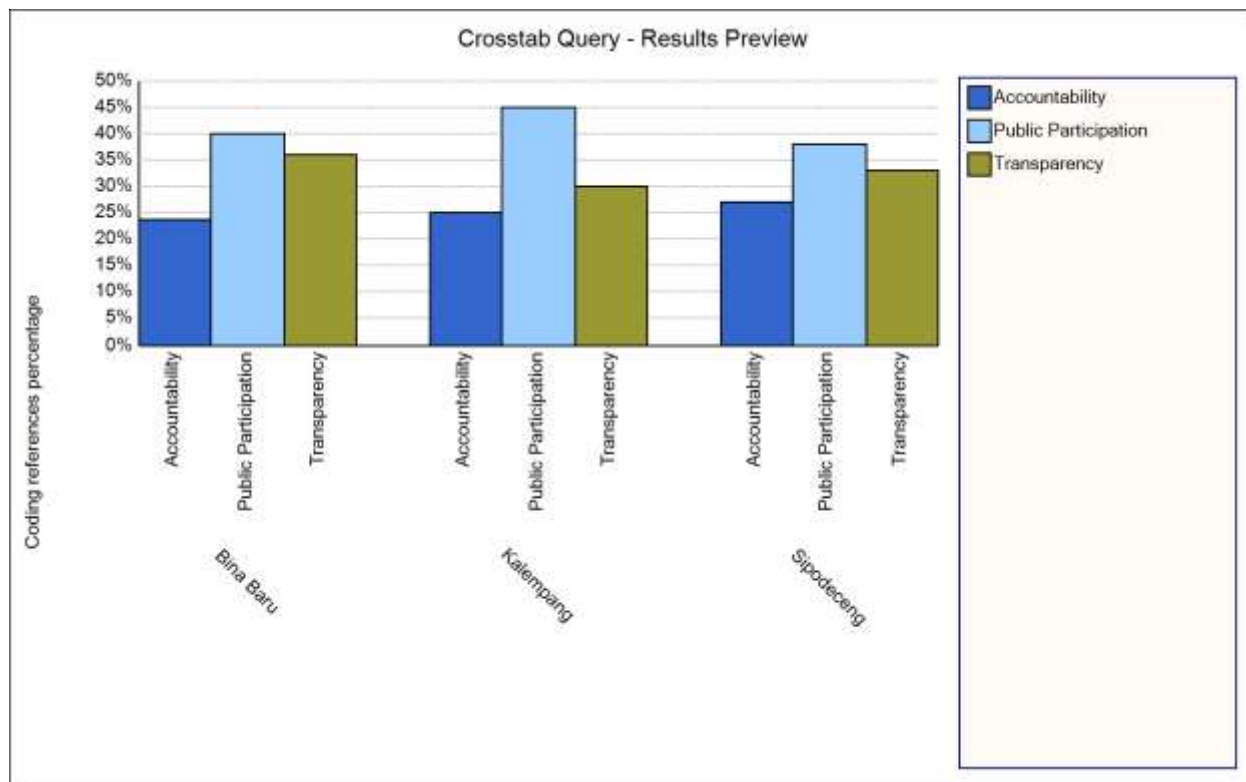


Figure 6. Governance principles in village fund management across Bina Baru, Kalempang, and Sipodeceng.

The diagram represents the relationships between crucial governance principles—public participation, accountability, and transparency—and essential stakeholders in the villages of Bina Baru, Sipodeceng, and Kalempang. Each village illustrates a network of interactions between Figures such as village heads (Kepala Desa), sub-village heads (Kepala Dusun), village consultative bodies (BPD), and the larger community (Masyarakat). These connections underline the essential role that public participation plays at every level of governance, displaying the active engagement of diverse stakeholders in governance processes. Moreover, accountability and transparency are also connected to various actors, which emphasizes their importance in promoting responsible governance practices and building trust within the community. This detailed network indicates that the success of governance in rural areas greatly depends on the harmonious integration of accountability, public participation, and transparency. The diagram emphasizes the necessity of comprehensive decision-making processes encompassing all stakeholders, especially when guaranteeing that governance reforms are sustainable and advantageous for the community. By illustrating these relationships, the study provides valuable insights into how different elements of governance interact to improve public service delivery and rural development, thereby reinforcing the urgent need for comprehensive governance frameworks in rural settings.

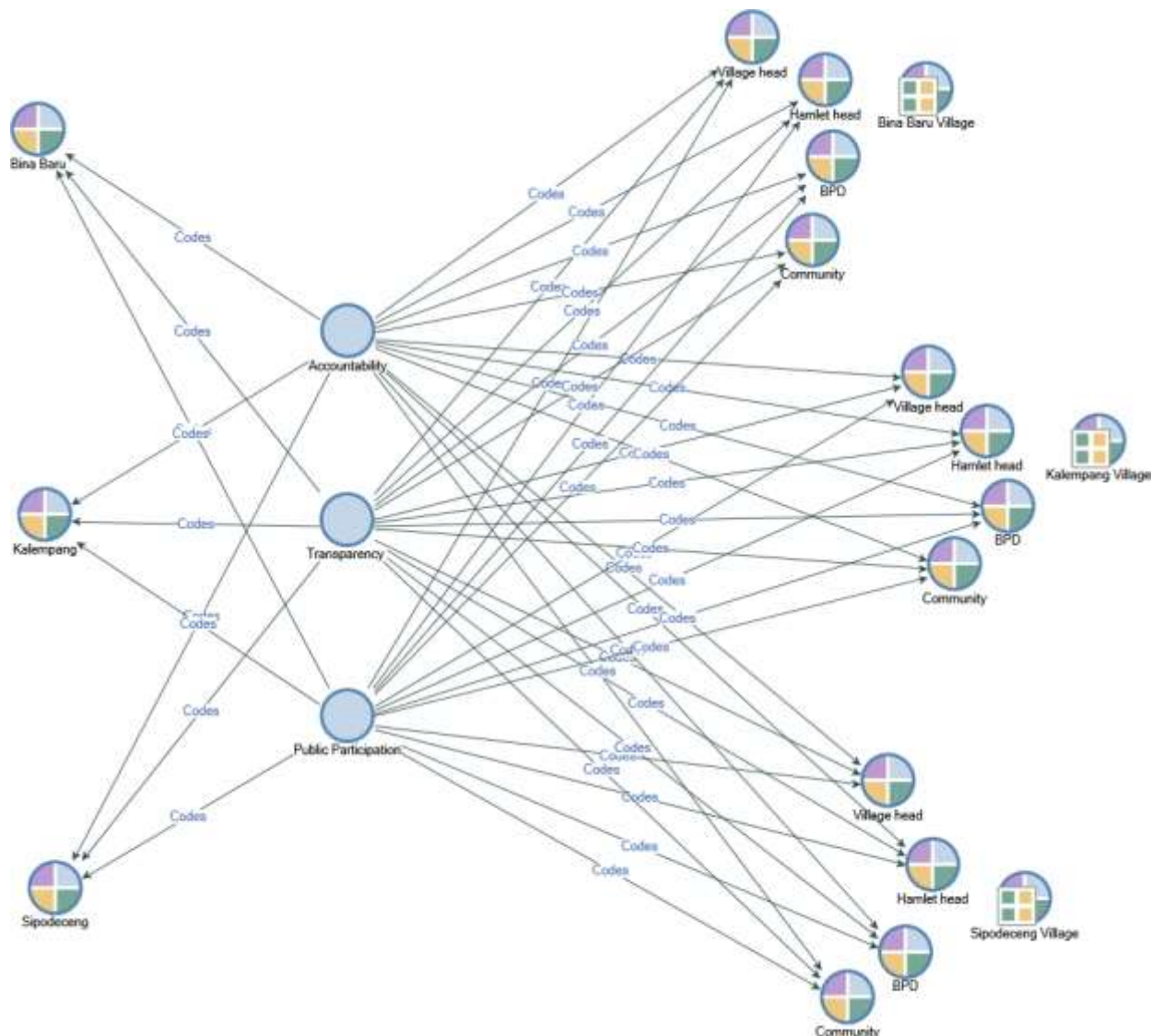


Figure 7.
NVivo data processing results by authors.

3.6. Challenges and Solutions

3.6.1. Infrastructure Access

Limited internet access in rural village offices, where most residents rely on private or paid networks, creates a significant obstacle to fully implementing technology-based public services. This limitation restricts the reach of digital platforms and reduces access to critical government services, hindering efforts toward digital governance and improved service delivery. The rollout of initiatives like Rais-MR3 must prioritize infrastructure development to ensure their effectiveness. Adequate technological infrastructure, including free or subsidized internet access in public spaces such as village offices and hamlets, is crucial for enhancing public engagement with e-government services. Recent studies show that expanding digital infrastructure, especially in rural and underserved communities, is essential for improving inclusivity and creating digitally enabled environments [12], [29]. Village governments can allocate funds or partner with private and governmental entities to install and

maintain wifi services, bridging the digital divide and enabling more equitable access to e-governance platforms.

3.6.2. *Human Resource Capacity*

The ability of village apparatus to operate technology-based applications is another crucial challenge impacting the success of integrating the Rais-MR3 model with digital governance platforms. Recent studies emphasize that the human factor is central to the success and sustainability of e-governance systems [30]. Limited technical expertise among local officials, particularly in managing data and maintaining digital services, can obstruct the full potential of digital governance. Thus, implementing robust capacity-building programs focused on technological proficiency for village staff is essential. Continuous training and long-term mentoring models ensure that necessary digital skills are acquired and applied in governance scenarios. Effective digital governance depends on infrastructure and skilled personnel who can manage these systems efficiently [31]. Investing in human capital development is critical to maximizing the benefits of cyber applications in village governance.

3.6.3. *Program Consistency*

Maintaining consistency in using technology platforms for public services, such as cyber applications, requires a long-term commitment from village leadership and apparatus. One of the key challenges in digital governance is sustaining engagement with new technologies over time [29]. Implementing standard operating procedures (SOPs) and monitoring systems can ensure that technology becomes integral to public service standards. However, these mechanisms are only sufficient with consistent financial and human resources to support program continuity. Village governments must secure dedicated budgets for training, system updates, and the maintenance of technology platforms. Moreover, establishing clear accountability structures within village administrations fosters a culture of responsibility and ensures that technology remains integral to governance. The long-term success of digital governance requires sustained investment and support to ensure efficient and transparent service delivery [31].

3.7. *Implementation of SIBERAS Integration in Villages*

3.7.1. *HR Training and Capacity*

To effectively implement the SIBERAS application or similar platforms in village governance, thorough training for village officials and leaders is essential. Utilizing digital governance tools requires technical skills and a solid understanding of effective village fund governance practices. Training should cover the application's technical elements such as data entry, processing, and reporting and key governance topics like transparency, accountability, and citizen engagement. Recent research emphasizes the value of capacity-building programs catering to local requirements, ensuring digital tools are used to their fullest potential [30]. Besides, continuous mentorship and skill development are essential to keep village officials knowledgeable about new features or upgrades in the system, promoting a digitally savvy workforce capable of maintaining effective use of these platforms [32].

3.7.2. *Development of Technological Infrastructure*

The effective deployment of SIBERAS or similar applications in rural village environments largely depends on the presence of adequate technological infrastructure. Access to reliable internet and modern computing devices is critical for integrating digital governance tools within village administrations. An essential step in this direction involves collaborations between village governments and internet service providers to ensure stable, high-speed internet that fulfills the operational demands of the village. Additionally, acquiring necessary hardware, such as computers and networking equipment, is essential. Recent studies show that developing infrastructure in rural settings is critical in enabling efficient delivery of e-government services [29]. Therefore, village governments must budget appropriately or

pursue external partnerships to meet the infrastructure needs that support technological progress in governance.

3.7.3. Policy Support

Strong policy and regulatory frameworks are critical for successfully adopting digital governance platforms like SIBERAS. Policies that promote standardized financial reporting, transparency in budgeting, and public accountability are necessary to use these systems effectively. For example, village fund governance policies should be compatible with national digital governance frameworks to ensure that SIBERAS adheres to legal standards concerning data privacy and financial transparency [31]. In the absence of such policies, the implementation of digital applications may encounter challenges, including inconsistent reporting practices and insufficient accountability. Regulatory support should also include guidelines for safeguarding digital platforms and protecting sensitive information, which is essential for maintaining trust in the system among village officials and the wider community.

3.7.4. Socialization to the Community

The successful adoption of SIBERAS or similar applications relies significantly on the active engagement and awareness of the community. It is essential for village residents to understand the platform's advantages, such as enhancing public services and promoting transparency in village governance. Socialization activities can be conducted through community meetings and workshops, and social media platforms accessible to the larger public can be utilized. Recent research suggests that public awareness and involvement are critical for the success of e-governance initiatives, as they promote a sense of ownership and active participation from the community [29]. Effective communication strategies should be employed to ensure residents know how to access and use the system, finally leading to a more comprehensive and transparent governance process.

4. Conclusion

The research indicates that combining the Rais-MR3 model with the SIBERAS application effectively answers the research question by enhancing transparency, accountability, and public participation in managing village funds. Case studies from Kalempang, Sipodeceng, and Bina Baru demonstrate that using digital platforms in governance results in more efficient operations, lowers the risk of corruption, and boosts community involvement. These findings affirm the model's potential to strengthen governance practices in rural regions. This research adds to the discussion on digital governance by displaying the practical advantages of integrating cyber applications into managing village funds. The model offers a scalable solution that can be implemented in other villages, thus improving the overall effectiveness of public service delivery and governance systems across Indonesia. Moreover, the study enhances the understanding of how technology can revolutionize governance in rural environments, promoting accountability and public engagement. Nonetheless, the research does have certain limitations, such as the requirement for technological infrastructure and human resource capacity in rural areas, which may obstruct the widespread adoption of the model. Future research should concentrate on long-term implementation and assess the model's adaptability in various rural settings. In addition, more resources should be dedicated to capacity-building initiatives and infrastructure improvement to guarantee the sustainability of this digital governance model.

Author Contributions

Muhammad Rais Rahmat Razak: Conceptualization, Methodology, Data Curation, Formal Analysis, Writing - Original Draft Preparation, and Supervision. Sandi Lubis: Investigation, Resources, Visualization, Writing - Review & Editing, and Validation.

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