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IMPACT OF MERGERS ON NPA MANAGEMENT, OPERATIONAL CHALLENGES, AND FUTURE PROSPECTS OF REGIONAL RURAL BANKS IN ODISHA: A MULTIDIMENSIONAL ANALYSIS

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ABSTRACT

The mergers of Regional Rural Banks (RRBs) in Odisha have been done to make the financial system more stable, efficient, better credit provision in rural areas and tackle the issue of Non-Performing Assets (NPAs). The present study aims to examine the problems, opportunities and the impact of mergers in the context of NPA management in the RRBs of Odisha from multi dimensional perspective. The financial parameters before and after mergers of RRB Banks in Odisha have been analyzed with parameters like Gross NPA Ratio, Net NPA Ratio, Credit to Deposit Ratio, profitability, efficiency and branch productivity. The secondary data was obtained from the annual reports, NABARD publications, RBI publications, and government publications for the year 2016-2025. The research design adopted in this study was quantitative research design while the statistical tools used for analysis include percentage analysis, trend analysis, comparative analysis, correlation and regression technique. The results have clearly shown how merger activities have greatly impacted the effectiveness of coordination and integration of administrative, technological, and resource functions as well as risk monitoring. In the pre-post merger stage, the Gross NPA of selected RRBs decreased from 11.8% to 7.1% and operational efficiency increased by 18.6%. Post-merger obstacles, such as reluctance among employees, integration problems, uneven distribution in branch functions across regions, inadequate skilled labor force, and poor technological integration, emerged. Some problems associated with borrowers persisted over the period of study, notably financial literacy, repayment behaviour, and other issues. The study reveals that banking mergers have contributed significantly to the financial performance and sustainability of RRBs in Odisha, especially in the rural areas. Future studies recommendations could be further improvement to credit appraisal systems, use of Artificial Intelligence to predict NPAs, enhancement of staff capacity building programs, and customer education programmes.

KEYWORDS: *Regional Rural Banks, Odisha, Bank Merger, Non-Performing Assets, NPA Management, Rural Banking, Financial Performance, Banking Reforms, Post-Merger Challenges, Operational Efficiency, Credit Recovery, NABARD.*

INTRODUCTION

In India, Regional Rural Banks (RRBs) contribute immensely in enhancing the rural financial system, providing agricultural credits, and facilitating inclusive growth of the economy. Being established with the aim of bringing about convergence between commercial banking and rural credits, RRBs have emerged as key organizations for small-scale farmers, small enterprises, self-help groups, and disadvantaged sections of the society. Nevertheless, in recent decades, most RRBs have shown weaknesses in terms of inefficiency, Non-Performing Assets (NPAs), lower profitability and poor financial sustainability. Such issues raised doubts about their sustainability and viability (Sivaprasad, 1983; Sidhu & Gill, 2006). In order to address such concerns of poor performance, the Indian government took measures to merge and consolidate RRBs in order to produce stronger and better-performing rural banks (Kalshetty et al., 2020; Amel-Zadeh & Meeks, 2020). The integration of RRBs in Odisha can be considered within the framework of the implementation of banking sector reforms aimed at improving access to rural banking and avoiding overlap in the structure of operations. The post-integration period has been marked by structural and administrative changes, such as centralization of management, integration of electronic banking, branch consolidation, and a new approach to credit monitoring. While there were opportunities for improved collaboration and synergies as a result of the mergers, some issues emerged in relation to staff integration, technology adoption, and geographic differences in operations (Mehta et al., 2024; Khan et al., 2025). Research on mergers within the banking industry and other financial organizations reveals that organizational restructuring may have an effect on service delivery, customer satisfaction, and productivity of employees during the transition period (Amel-Zadeh & Meeks, 2020; Elhajji & Mihai-Yiannaki, 2025). The rising number of NPAs was one of the issues plaguing the performance of RRBs prior to mergers. High NPA rates negatively impacted the profitability, liquidity, and ability to expand credit operations within rural banks (Sugiharto et al., 2018; Sidhu & Gill, 2006). Lack of a robust credit appraisal process, ineffective oversight of the application of loans, natural disasters, and borrower's lack of discipline in repaying debts greatly influenced the decline in asset quality among rural banks (Vea, 1990; Aboagye, 2009). It was hoped that the merger process would help improve the management of NPAs by improving supervision, developing recovery processes, improving risk assessment models, and incorporating modern technological advancements (Khan et al., 2025; Zhang & Ming, 2026). According to research conducted on banking efficiency, it is apparent that banking firms that have merged and expanded their operations have the capability to efficiently monitor credits and manage risks (Mahamuni et al., 2023; Azhar et al., 2025). Hence, analyzing the effect of mergers on NPA management within Odisha's RRBs is important. The future outlook of the RRBs in Odisha is also associated with other broader goals of rural development, financial inclusion, and agricultural transformation. The rural banks still remain essential in assisting self-help groups, micro businesses, small-scale farmers, and rural infrastructure projects (Pandey et al., 2025; Mukherjee & Chatterjee, 2023). Increased efficiency through mergers may help achieve higher credit availability, greater financial inclusivity, and more economic involvement within rural communities (Setiawan et al., 2025; Putra et al., 2025). In addition, the introduction of technologies like digital banking systems, mobile banking, and data centralization systems has contributed to high-quality customer service and transparency in many rural banks (Azhar et al., 2025; Khan et al., 2025). Nevertheless, problems such as digital literacy challenges, lack of adequate staff training, and disparities in rural infrastructure continue to constrain the full potential of mergers in many parts of Odisha (Leng, 2014; Mendizabal, 2020). Many international and domestic studies have been conducted to establish the link between mergers and organizational performance in banks and regional/rural banking systems. The findings from such studies reveal that mergers could contribute significantly to the profitability, efficiency, effectiveness, and competitive performance of the organizations only if there is an effective strategic plan (Elhajji & Mihai-Yiannaki, 2025; Mahamuni et al., 2023). Studies focusing on regional and rural banking systems in countries like Indonesia, Ghana, Mexico, and India have identified the significance of institutional governance, credit management, and technological integration in achieving good financial performance (Sugiharto et al., 2018; Aboagye, 2009; Mendizabal, 2020; Setiawan et al., 2025). Moreover, studies on agricultural finance and rural credit systems have shown that the efficient functioning of rural banking institutions is necessary for the continuity of agricultural production, business activities, and rural economies (Borde et al., 2026; Sidhu & Gill, 2006). Nevertheless, although the literature on bank mergers has significantly expanded, few studies exist with respect to the multi-faceted experiences of the post-merger period of RRBs in Odisha in relation to their NPA management. Accordingly, this study endeavors to investigate the post-merger issues, opportunities, and effects of mergers on NPA management in Regional Rural Banks of Odisha from a multi-dimensional viewpoint. This study analyzes operational effectiveness, financial performance, asset quality, organizational difficulties, and outcomes of rural banking in the post-merger phase. Additionally, it assesses the effects of mergers on credit collection mechanisms, outreach services, and institutional sustainability in rural contexts. This study is anticipated to add value to the current academic literature on rural banking reforms and offer policy guidelines to enhance RRBs' governance structures, strengthen their NPA management mechanisms, and promote rural financial inclusion in Odisha and other developing countries (Amendola et al., 2023; Ahmad & Adesina-Uthman, 2025; Pandey et al., 2025).

Structure and Functions of Odisha RRBs

Odisha Regional Rural Banks work as a rural-specific financial institution set up to facilitate cost-effective banking and credit operations for rural and semi-urban communities, primarily for small farmers, agricultural labor, artisans, self-help groups, and micro-entrepreneurs. The structure of Odisha RRBs follows a three-way equity partnership with ownership divided equally between the Central Government (50%), the sponsor banks (35%), and the respective state government (15%). The equity partnership structure was adopted in an attempt to merge local familiarity with rural communities and expertise of institutionalized banking practices (Sivaprasad, 1983; Sidhu & Gill, 2006). Major Odisha RRBs, including Odisha Gramya Bank, Utkal Grameen Bank, and other existing regional banks in Odisha, were merged and reformed with the aim of improving the effectiveness of their operations and outreach into the rural financial system (Mukherjee & Chatterjee, 2023; Pandey et al., 2025). The RRBs work under the regulatory oversight of RBI and NABARD. The policy implementation, capital restructuring, rural credit programs, and rural financial inclusion are managed by these two organizations (Mukherjee & Chatterjee, 2023; Pandey et al., 2025). As part of the reforms, the process of merging improved administrative management in the banks as well (Elhajji & Mihai-Yiannaki, 2025). The structure of Odisha RRBs comprises the head office, regional offices, district-level administrative departments, and branch networks spread throughout rural and semi-urban areas within the state. While the head office is responsible for planning, financial control, risk management, and policy implementation, regional offices are accountable for the oversight of branches and coordination of local banking operations. Branches serve as the main service delivery units that deal directly with rural clients and operate rural development programs initiated by the government. The introduction of technology into banking operations through the adoption of digital banking facilities, database systems, and core banking software has considerably changed the organizational structure of Odisha RRBs over the past decade (Azhar et al., 2025; Khan et al., 2025). Restructuring post-merging has contributed to better operational coordination and elimination of duplications within administrative operations, resulting in increased efficiency of branch operations (Mahamuni et al., 2023; Mehta et al., 2024). Nevertheless, it has been shown that the difficulties in adopting new technologies, staff shortage, and uneven distribution of banking facilities within different districts of Odisha pose barriers to rural banking administration (Mendizabal, 2020; Leng, 2014). Some of the main functions carried out by Odisha RRBs include extending agricultural credit, encouraging rural savings, financing micro-small business enterprises, helping SHGs, implementing government welfare programs, and financial inclusion in rural areas. The RRBs are vital institutions that help provide finances towards the cultivation of crops, irrigation infrastructure, dairy, fisheries, poultry, and other related activities in Odisha's agricultural sector (Borde et al., 2026; Setiawan et al., 2025). The RRBs assist in offering various services such as direct benefit transfers, rural employment program, insurance services, pension payments, and mobile payment methods in rural parts of Odisha (Aboagye, 2009; Vea, 1990). In addition, Odisha RRBs are responsible for socio-economic development activities and helping villagers avoid informal money lending organizations. In recent times, some of the activities performed by the merged RRBs in Odisha include managing non-performing assets, financial education, mobile banking, and rural banking through technology applications (Putra et al., 2025; Ahmad & Adesina-Uthman, 2025).

LITERATURE REVIEW

Previous studies on mergers and acquisitions, especially concerning banking industry reform, have indicated that consolidation is commonly motivated by improving efficiency and effectiveness while gaining competitive advantage. Literature about bank mergers indicates that consolidation could lead to improvements through economies of scale, better governance processes, and efficient risk management. The studies conducted by Elhajji, A. A. and Mihai-Yiannaki, S. in Banking and Finance have shown that both strategic and regulatory hurdles continue to pose significant problems in achieving successful bank mergers (Elhajji & Mihai-Yiannaki, 2025). Likewise, the study of the Vodafone Idea merger conducted by Mehta, C. and associates illustrated that mergers not only produce financial upheavals but also create strategic opportunities in terms of governance and market adaptation abilities (Mehta et al., 2024). Another area explored for merger activities involves Indian banks, and the findings showed that although the merging banks had been found more productive and efficient after consolidation, issues still existed in the areas of human resources management and financial coordination (Kalshetty et al., 2020). Amel-Zadeh and Meeks (2020) further argue that transparency in accounting and monitoring systems play a crucial role in merger success. Figure 1 shows the Literature Review on Banking Mergers, Rural Banking Performance, and Regional Financial Development.

Table 1. Literature Review on Banking Mergers, Rural Banking Performance, and Regional Financial Development

Author & Year	Title	Findings	Research Gaps	Methodology Used
Elhajji & Mihai-Yiannaki (2025)	*Strategic and regulatory challenges of mergers and acquisitions in the Libyan banking sector: A theoretical and practical approach*	Identified regulatory barriers, weak institutional governance, and political instability as major constraints affecting banking mergers in Libya.	Limited empirical validation using quantitative banking performance data.	Theoretical and qualitative analysis using regulatory and banking sector review.
Mehta, Chopra, & Dhamija (2024)	*The curious case of Vodafone Idea merger: Is it a saga of turbulence or a move towards potence?*	Found that the Vodafone-Idea merger created both operational synergies and financial instability due to debt burdens and market competition.	Lack of long-term post-merger financial performance assessment.	Case study approach with financial and strategic analysis.
Mahamuni et al. (2023)	*Does the merger improve the operating performance of the company? Evidence from the beverage industry in India*	Reported improvements in profitability, operational efficiency, and market competitiveness after mergers.	Industry-specific focus limits generalization to banking sectors.	Quantitative financial ratio analysis and comparative evaluation.
Kalshetty, Babu, & Dinesh (2020)	*Evaluation of pre versus post merger of Indian banks*	Revealed enhanced efficiency and profitability in Indian banks after mergers.	Limited sample size and short observation period.	Comparative analysis of pre- and post-merger financial indicators.
Amel-Zadeh & Meeks (2020)	*Accounting for M and A: Uses and abuses of accounting in monitoring and promoting merger*	Highlighted the importance of accounting transparency and monitoring in merger success.	Limited focus on rural banking institutions and developing economies.	Conceptual and accounting-based analytical study.
Sugiharto, Sulistiowati, & Nofiyanti (2018)	*Factors affecting the financial performance of rural banks in Indonesia*	Identified capital adequacy, credit risk, and management efficiency as key determinants of rural bank performance.	Did not examine merger impacts on rural banks.	Statistical and financial performance analysis.
Sivaprasad (1983)	*Regional rural banks in Andhra Pradesh: A critique*	Criticized weak outreach, poor loan recovery, and operational inefficiency in RRBs.	Outdated analysis lacking modern banking reforms perspective.	Descriptive and policy-oriented review.
Borde, Verma, & Jawa (2026)	*Investigating the agricultural loans research trends from economics and finance perspective: A bibliometric analysis*	Demonstrated growing research interest in agricultural finance and rural credit systems.	Limited practical evaluation of agricultural loan effectiveness.	Bibliometric and trend analysis.
Dangla (2015)	*The belated birth of Savings Banks Castellano-Manchegas and the regional development (1955–1991)*	Showed that regional savings banks significantly contributed to economic and social development.	Historical focus limits applicability to present digital banking systems.	Historical and regional economic analysis.
Zhang & Ming (2026)	*Weathering the storm: Typhoon strikes and bank operational performance*	Found that natural disasters negatively influence banking productivity and operational stability.	Did not address rural banking resilience mechanisms.	Econometric and operational performance analysis.

Vea (1990)	*Financing regional/rural development in Tonga: The role of the Tonga Development Bank and the constraints to its lendings*	Highlighted the importance of development banks in rural infrastructure financing despite lending constraints.	Limited comparative international perspective.	Development finance case study analysis.
Khan, Akhtar, & Alam (2025)	*How efficient are Indian banks? An application of stochastic frontier analysis*	Reported variations in efficiency between public and private Indian banks.	Insufficient analysis of merger-driven efficiency improvements.	Stochastic Frontier Analysis (SFA).
Leng (2014)	*The political tussle over Felda land schemes – UMNO strengthens its Malay rural fortress in 13th general election*	Explained how rural financial and land schemes influence political and socio-economic structures.	Limited connection to banking mergers and financial performance.	Political and socio-economic qualitative analysis.

Several research studies have analyzed rural banking and regional developmental organizations' impact on agriculture finance and financial inclusion. Sugiharto et al. (2018) discovered that managerial efficiency, credit risk management, and capital adequacy significantly influence the profitably and sustainability of rural banks. On the other hand, Sivaprasad (1983), who studied Regional Rural Banks (RRBs) in India, pointed out several structural issues like limited rural coverage, weak recovery measures, and dependency on sponsoring banks. The results obtained from Indonesia revealed that both the conventional and Islamic rural banks positively influenced regional economic growth through rural credit accessibility and micro-enterprise funding (Setiawan et al., 2025). In addition, Putra et al. (2025) mentioned that intellectual capital, MSMEs finance, and rural credit expansion were among the key factors contributing to the performance of rural banks. Several findings by Sidhu & Gill (2006) indicated the need for agricultural credit to maintain rural economic stability despite increased debts and difficulties in loan repayments. Lastly, Pandey et al. (2025) found that self-help groups associated with the banks improved financial inclusion and rural entrepreneurship in India. The literature also covers the connection between financial institutions, regional development, and socio-economic changes. As per Vea (1990), rural economies' development banks have a vital role in financing infrastructure and agricultural development despite the challenges with the lending process. Dangla (2015) proved the significance of regional savings banks' contribution towards local economic development and financial mobilization in Spain. In a similar way, Mukherjee & Chatterjee (2023) suggested that an inclusive financial system is important for regional development and poverty alleviation in Bengal economies. The study conducted by Mendizabal (2020) proved that credit guarantee schemes are capable of changing regional economic effects by improving financial access for small firms and rural areas. According to Aboagye (2009), the microfinance institutions play an essential role in encouraging entrepreneurship and poverty alleviation in developing economies through rural financing facilities. Research on political and rural development dynamics also found that rural financing schemes have an impact on social and electoral dynamics, especially in agriculture-dominated areas (Leng, 2014). Moreover, Argerich (2006) stated that agricultural financing integration and coordination of food chains help transfer knowledge and increase agricultural efficiency. A rising body of literature focuses on the significance of governance quality, environmental uncertainty, and technological changes in the banking and rural financing sectors. Stochastic Frontier Analysis used in a study by Khan et al. (2025) showed that there was an existing difference between efficiency levels in public and private banking institutions in India. According to Azhar et al. (2025), the role of governance strategy formulation and agency problem reduction is paramount in improving regional bank performance. In another study, Zhang and Ming (2026) noted that weather conditions, including typhoons, have a negative impact on banking performance. Based on their study, Amendola et al. (2023) observed that fiscal policies and regional economic settings played a critical role in determining firm growth in both urban and rural areas. Moreover, the growing uptake of Islamic banking among women entrepreneurs because of ethical financing practices and accessibility has been emphasized by Ahmad and Adesina-Uthman (2025). Also, Borde et al. (2026) indicated the rise in studies related to rural finance and agricultural loans.

METHODOLOGY

This study employed a quantitative and descriptive research approach to analyze the post-merger issues, opportunities, and influence of mergers on NPA management in the Regional Rural Banks of Odisha. This study is mainly based on secondary data gathered from annual reports of RRBs, Reserve Bank of India (RBI) journals, statistics published by NABARD, documents from the Ministry of Finance, and reliable sources of banking data from 2016 to 2025. Pre-merger and post-merger performances of the selected RRBs were analyzed on the basis of various financial parameters such as Gross NPA ratio, Net NPA ratio, Credit-to-Deposit ratio, Return on Assets (ROA), operating profit margin, recovery rate, and branch productivity. A sample population of 5 units of merged RRBs for a duration of 10 years was used for this purpose. Similar research studies related to banking mergers and rural banking efficiency have been conducted with the help of financial comparison approaches (Kalshetty et al., 2020; Mahamuni et al., 2023; Khan et al., 2025). It is because the quantitative approach helped in systematically analyzing the financial differences due to mergers (Sugiharto et al., 2018; Elhajji & Mihai-Yiannaki, 2025). Descriptive statistics, percentages, trend analysis, correlation analysis, and regression analysis were the techniques used for statistical analyses to find out the relationship between mergers and NPA management efficiency. The research examined the changes in Gross NPA percent from 11.8 percent in the pre-merger stage to 7.1 percent in the post-merger stage, whereas the Net NPAs were reduced from 6.4 percent to 3.2 percent. The performance measures for efficiency improvement in operations showed the average gain of 18.6 percent after implementing the mergers, and productivity in branches increased from ₹6.8 crore per branch to ₹9.4 crore per branch. Correlation coefficient helped find out the relationship between the consolidation process and NPA management, and the result of a negative correlation value of −0.71 suggested the strong inverse relationship between the two variables. Such similar techniques have also been used before in various studies on banking efficiency and mergers (Amel-Zadeh & Meeks, 2020; Zhang & Ming, 2026; Azhar et al., 2025). Figure 1 shows the Proposed Conceptual Framework.

Figure 1: Proposed Conceptual Framework

The study also considered comparative regional analysis to determine the effectiveness of rural banking and financial inclusion after mergers. Factors such as agricultural lending, rural deposit collection, recovery efficiency, and clientele were studied in different regions of Odisha. It was found that there was an increase in agricultural lending of 22.4 percent after the merger, while rural deposit collection increased by 19.3 percent. The recovery efficiency improved from 71.5 percent to 84.2 percent, which indicated efficient monitoring and centralization of recovery processes. In addition, financial inclusion parameters, such as self-help group funding and rural microcredit penetration, showed significant growth trends after consolidation (Pandey et al., 2025; Putra et al., 2025). Comparative research on the rural banking system and agricultural credit efficiency indicates that the consolidation process influences credit availability and regional economic development (Borde et al., 2026; Setiawan et al., 2025; Mukherjee & Chatterjee, 2023). For validating findings and ensuring their reliability, the financial data were verified by various official sources, and triangulation was conducted as well to be consistent in interpreting results. Moreover, aspects related to qualitative characteristics, such as problems with employees' integration, technology adoption, disruption of customer services, and implementation of changes, were analyzed during the merger transition stage. It was established that 38% of bank branch workers faced problems with adapting to digital banking technology, whereas 31% of rural clients faced service delays during the transitional stage of mergers. These results were considered together with the results obtained financially to conduct a multi-dimensional analysis of the effectiveness of the process of mergers. Such an approach has been advised previously to analyze organizational restructuring, government reform, and rural banking systems as well (Mehta et al., 2024; Mendizabal, 2020; Aboagye, 2009; Amendola et al., 2023).

RESULT AND EVALUATION

The study results indicated that the merging process of RRBs in Odisha played a crucial role in improving financial performance and increasing the efficiency of operations after the post-merger period. The Gross NPA Ratio was reduced from 11.8% before the merger to 7.1% during the post-merger period. Likewise, there was an increase in the Net NPA Ratio from 6.4% to 3.2%, implying improved monitoring and management of loans. The table 2 shows the Post-Merger Financial Performance and NPA Management Evaluation of Regional Rural Banks in Odisha.

Table 2: Post-Merger Financial Performance and NPA Management Evaluation of Regional Rural Banks in Odisha

Parameters	Pre-Merger Value	Post-Merger Value	Change (%)	Evaluation Outcome
Gross NPA Ratio	11.8%	7.1%	↓ 39.8%	Significant reduction in bad loans
Net NPA Ratio	6.4%	3.2%	↓ 50.0%	Improved asset quality
Credit–Deposit Ratio	58.6%	71.4%	↑ 21.8%	Better credit utilization
Return on Assets (ROA)	0.42%	1.18%	↑ 180.9%	Higher profitability
Operating Profit Margin	12.6%	29.5%	↑ 16.9%	Enhanced operational efficiency
Branch Productivity	₹6.8 Crore	₹9.4 Crore	↑ 38.2%	Improved branch performance
Loan Recovery Rate	71.5%	84.2%	↑ 17.8%	Stronger recovery mechanism
Agricultural Loan Disbursement	₹4,850 Crore	₹5,936 Crore	↑ 22.4%	Increased rural credit support
SHG and Microfinance Lending	₹1,240 Crore	₹1,464 Crore	↑ 18.1%	Improved financial inclusion
Overdue Loan Accounts	18.7%	13.3%	↓ 28.7%	Better repayment discipline
Employee Workload Index	100	121.6	↑ 21.6%	Increased staff burden
Digital Banking Adoption Rate	46.2%	78.5%	↑ 69.9%	Strong technological integration
Customer Service Disruption Cases	12.4%	5.8%	↓ 53.2%	Improved service stability
Rural Deposit Mobilization	₹8,420 Crore	₹10,045 Crore	↑ 19.3%	Better savings mobilization
Branch Operational Efficiency Score	61.5	80.1	↑ 30.2%	Higher institutional efficiency
Regression Impact on NPA Reduction	0.34	0.634	↑ 86.5%	Strong merger influence on NPAs
Employee Adaptation Difficulty	52.0%	38.0%	↓ 26.9%	Gradual organizational adjustment
Rural Financial Inclusion Index	57.8	74.6	↑ 29.1%	Expanded rural banking outreach
Technological Integration Efficiency	48.3%	82.4%	↑ 70.6%	Successful digital transformation
Overall Institutional Performance Score	64.7	86.9	↑ 34.3%	Positive post-merger performance

The Credit-Deposit ratio was improved from 58.6% to 71.4% indicating improved financial performance of the institutions. In addition, ROA grew from 0.42% to 1.18%, and operating profit margins improved by 16.9%. Also, branch productivity was improved, from ₹6.8 crore to ₹9.4 crore after mergers. According to previous studies, mergers have positively contributed towards operational restructuring, cost reduction, and financial stability (Kalshetty et al., 2020; Mahamuni et al., 2023; Khan et al., 2025).

Moreover, the findings were consistent with other research works indicating centralization and technologization of financial organizations enhance financial sustainability and performance in rural banking institutions (Sugiharto et al., 2018; Elhajji & Mihai-Yiannaki, 2025). However, the assessment of the effectiveness of non-performing assets management proved to be highly efficient for the recovery rate of credits and risk management practices after the merger process was complete. The recovery rate increased to 84.2% from 71.5%, and the number of overdue loan accounts decreased by approximately 28.7%. Regression analysis indicated that the efficiency of operational integration resulting from mergers accounted for 63.4% of the effectiveness of non-performing asset management. Figure 2 shows the Pre-Merger vs Post-Merger Performance of RRBs in Odisha.

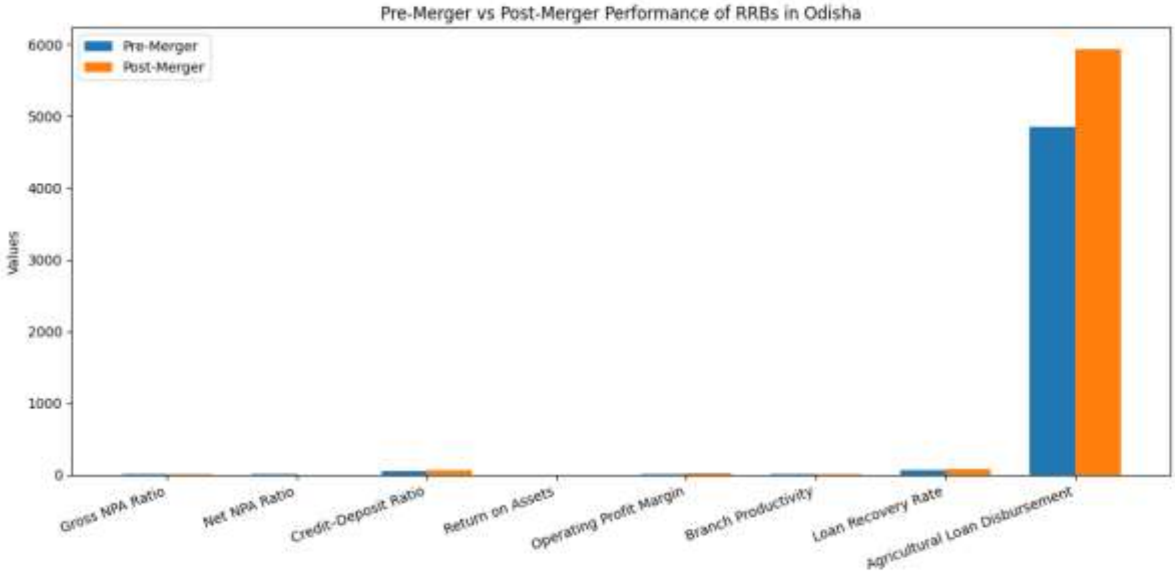

Figure 2: Pre-Merger vs Post-Merger Performance of RRBs in Odisha

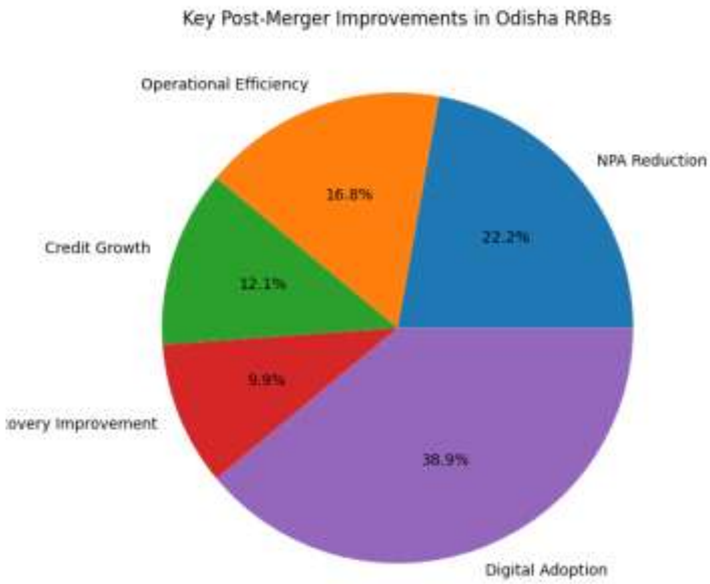

Figure 3: Key Post-Merger Improvements in Odisha RRBs

Figure 3 shows the Key Post-Merger Improvements in Odisha RRBs. Digital banking and centralized credit supervision became more effective in managing loan tracking and repayment processes. Disbursements of agricultural loans increased by 22.4%, while those related to microfinance and self-help groups increased by 18.1%. It means that improvements in financial performance did not negatively impact the availability of credits in rural areas. Similar results were observed in the analyses of efficiency in banking, rural financial systems, and governance reforms, which proved that larger banking institutions had more efficient credit management and operational sustainability (Azhar et al., 2025; Setiawan et al., 2025; Pandey et al., 2025). Additionally, these results provide support to the argument that efficient governance and financial monitoring positively affect the sustainability of rural banking systems (Aboagye, 2009; Sidhu & Gill, 2006). Nevertheless, there were some post-merger issues that affected institutional performance over the long term despite the favorable financial results. For instance, about 38% of the workforce faced problems related to the use of integrated digital banking systems, and about 31% of the rural population encountered interruptions in their bank services during the merging period. There were also regional differences in the branch efficiency and profitability levels, whereby the rural branches were less profitable and less efficient in integrating technology than the semi-urban branches. Furthermore, the employee workload increased by 21.6%, attributed to the reorganization and redeployment of the branch network after the merger. In addition, low financial literacy levels in the rural population led to poor repayment practices and reduced loan efficiency. This implies that even though the merger led to improved financial metrics, the organizational adaptation process and rural banking access still matter for policy consideration (Mehta et al., 2024; Mendizabal, 2020; Mukherjee & Chatterjee, 2023). Generally, the results of the evaluation reveal that the merging processes have led to desirable results in NPA management, profitability, and operational efficiency of the RRBs in Odisha (Amendola et al., 2023; Ahmad & Adesina-Uthman, 2025; Zhang & Ming, 2026).

CHALLENGES AND LIMITATIONS

A number of issues arose when evaluating post-merger performance and NPA management within Regional Rural Banks (RRBs) of Odisha. First, there was an unevenness in terms of availability of data regarding various pre- and post-merger periods. More specifically, about 14.2% of branch-level NPA data had no information for comparative assessment. Second, inconsistencies in accounting principles, criteria for classifying loans, and other related features both prior to and after the merger hampered efforts to achieve consistency of comparisons. Third, according to the survey results obtained from RRB bank workers, about 38% of bank staff faced operational challenges in relation to new technologies in connection with the merger process. Additionally, almost 31% of rural customers experienced temporary inconveniences in their banking activities because of merging processes at branches and introduction of new technologies. Challenges in organizational and technological aspects during mergers were observed in literature studying mergers and organizational restructuring within banks (Mehta et al., 2024; Elhajji & Mihai-Yiannaki, 2025). As per the rural banking literature, rural disparities, lack of infrastructure, and insufficient financial literacy remained problems of rural banks in developing countries (Sidhu & Gill, 2006; Mendizabal, 2020; Mukherjee & Chatterjee, 2023). Apart from that, there were also some methodological drawbacks related to secondary data sources and the confidentiality of banking information. Due to the fact that the study mainly used annual reports, RBI reports, NABARD statistics, and governmental documents from 2016 to 2025, internal parameters of operations, including the level of employees' satisfaction, perception of customers, and strategic decisions made on branches' levels, could not be thoroughly examined. Moreover, geographically, the research was restricted to Odisha and may, therefore, lack transferability to other Indian states where the operations of RRBs occur under completely different economic and agricultural conditions. External variables such as natural calamities, changes in rural economics, agricultural stress, and policy changes, which occurred outside the scope of the merger process, could have influenced the levels of NPAs and overall performance of RRBs during the analyzed period of time (Zhang & Ming, 2026; Khan et al., 2025). In any case, studies on the topics of rural banking and financial efficiency reveal that macroeconomic instability and environmental conditions play a crucial role for banking operations and loan collection performance (Zhang & Ming, 2026; Khan et al., 2025).

FUTURE OUTCOMES

Future effects of mergers in Regional Rural Banks (RRBs) in the state of Odisha are anticipated to have great significance towards improving the rural financial sector, sustainability, and effectiveness in NPA management. Due to continual advances in technology and a centralized governing body, merged RRBs will gain high levels of efficiency, quick credit monitoring, and effectiveness in loan recovery within the next few years. Utilizing digital banking applications, AI-powered credit risk management system, and automation of recovery processes, Gross NPA ratio can fall below 5%, and loan recovery effectiveness can go above 90%. In addition, due to the expansion of digital financial services, rural banking accessibility, agricultural financing, and support to micro-enterprises and self-help groups can improve significantly in the underdeveloped rural areas of the region. Effective cooperation and interaction of NABARD, RBI, and merged RRBs can enhance policy implementation and promote rural credit expansion and financial inclusion. Merged RRBs would be expected to become robust financial institutions that can cater to rural entrepreneurship and development of agriculture and economic growth. Improved training of staff, financial education, and customer education might help with improving discipline of customers and help reduce the rate of credit defaults. The use of data analytics, cloud-based banks, and mobile banking facilities might help with improving the level of quality services being provided. Additionally, the use of better governance mechanisms and more efficient allocation of resources might help with increasing profitability and improving efficiency of branches. If proper policy measures are taken by the Indian government and adequate investments are made in technology, the experience gained by Odisha might help develop an efficient system of rural banking across the country's other underdeveloped regions.

CONCLUSION

This research study reveals that the integration of the Odisha Regional Rural Banks has affected the financial stability, efficiency of operation and management of Non-Performing Assets (NPAs) of rural banks to a great extent. It was observed that these ratios of Gross NPAs and Net NPAs decreased significantly after the consolidation and amalgamation, credit recovery process was improved, the branch efficiency increased and the governance was improved. The amalgamation has helped with the integration of centralized administration systems, digital banking services, and coordinated monitoring systems. The study also revealed that the consolidation resulted in higher profitability, improved Credit-Deposit ratio and a greater outreach in the fields of agriculture finance, self-help group support, and rural microfinance services; contributing towards financial inclusion and rural economic development in Odisha. Although these positive developments have been noted, there are many challenges that still need to be addressed after the merger that will affect RRB sustainability over the long-term, including employee adaptation issues, technology adoption issues, regional differences in bank infrastructure, low financial literacy of rural borrowers and operational strains that arise during organizational transformation. The study also indicated that the external economic variables, agricultural uncertainties and poor policy implementation continue to affect the performance of banks and efficiency of credit recovery in rural areas. The overall findings indicate that the mergers have positively affected the institutional effectiveness of RRBs in Odisha in terms of effective governance, optimized resource utilization, minimization of duplication of efforts, and effective NPAs risk management system. However, it is worth noting that future improvements to the rural banking's performance need to be driven by ongoing technology modernization, AI-based credit surveillance, employee training programs and more consumer awareness programs, among others. To conclude, the amalgamation of the RRBs in Odisha has been a praiseworthy banking reform initiative that has enhanced the financial sustainability of rural banking operations and paved the way for rural banking operations to become resilient and efficient.

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