A State-wise Analysis of RIDF Expenditure Patterns under NABARD in India

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Abstract

This paper presents a state-wise analysis of expenditure patterns under the Rural Infrastructure Development Fund (RIDF), a critical instrument of rural capital formation in India managed by the National Bank for Agriculture and Rural Development (NABARD). The study seeks to evaluate the rural population and equity of RIDF total allocations across Indian states, identify inter-state disparities, and assess the sectoral allocation over time. Drawing on secondary data from NABARD annual reports, state budgets, and national infrastructure databases, JJM database for rural population, trend analysis, and the correlation coefficient and regression analysis to examine allocation, sanction, and disbursement patterns. The results reveal significant inter-state variation in RIDF sanction, with states such as States like Uttar Pradesh, Bihar, and West Bengal, with large rural populations, have received higher total sanctions. In contrast, lower-performing states such as Northeastern and smaller states such as Nagaland, Mizoram, and Sikkim have received lower sanctions; the findings suggest that RIDF, while instrumental in supporting rural infrastructure, has not uniformly contributed to balanced regional development. The paper argues for enhanced policy measures including capacity development, performance-based incentives, and integrated planning to improve allocate efficiency and developmental impact, thereby aligning RIDF more closely with the objectives of inclusive economic growth.

Keywords: RIDF, NABARD, Fund allocation, India, Rural population.

Introduction:

India's sustained economic growth over the past few decades has not been uniformly accompanied by corresponding improvements in rural infrastructure. With over two-thirds of the population residing in rural areas, deficiencies in basic infrastructure such as roads, irrigation networks, storage facilities, and healthcare services continue to impede agricultural productivity and limit access to essential services. Bridging this infrastructure gap is crucial not only for enhancing rural livelihoods but also for achieving inclusive and sustainable economic development.to address these challenges, the Government of India established the Rural Infrastructure Development Fund (RIDF) in 1995–96, administered by the National Bank for Agriculture and Rural Development (NABARD). The RIDF was conceived as a mechanism to provide low-cost, long-term financing to state governments for rural infrastructure projects, particularly in areas where private investment is scarce and fiscal capacity is limited. Since its inception, the RIDF has expanded significantly, financing over 700,000 projects across various sectors including irrigation, rural roads, agriculture, rural bridge, and social sector infrastructure. Despite the RIDF's critical role in augmenting rural infrastructure, notable inter-state disparities have emerged in both fund allocation and rural population. While some states consistently demonstrate high fund absorption and project execution efficiency, others lag behind due to administrative inefficiencies, institutional weaknesses, or geographic constraints. Although previous studies have explored the overall contributions of RIDF to rural development, there remains a significant research gap in understanding state-wise expenditure patterns**,** sectoral allocations, and the determinants by rural population this study seeks to address this gap by investigating the central research question: How do RIDF expenditure patterns vary across Indian states, and what economic and institutional factors explain these differences in fund allocation and sectoral focus?

Using secondary data sourced from NABARD, state budget documents, and government infrastructure databases, the study conducts a comprehensive state-wise and sectoral analysis of RIDF expenditure. By identifying trends, disparities, and underlying drivers of variation, the findings aim to inform evidence-based policymaking particularly in optimizing inter-state resource allocation, designing performance-linked incentive structures, and enhancing the effectiveness of rural infrastructure investments under RIDF.

Literature Review:

The Rural Infrastructure Development Fund (RIDF), launched in 1995–96 and managed by NABARD, has been a focal point in the discourse on rural capital formation in India. Dadhich (2014) underscores the persistent inadequacy of rural infrastructure despite the fund's intent, highlighting inefficiencies in fund utilization and incomplete project implementation. Mitra (2022) charts the remarkable expansion of RIDF from an initial corpus of ₹2,000 crore to over ₹4 lakh cr by FY 2022 while recognizing its contribution to India's broader development goals such as the SDGs. However, the analysis lacks critical evaluation of implementation challenges. Sen, Chakraborty, and Guha (2011) offer a nuanced critique of NABARD's devolution criteria, identifying systemic allocation biases that disadvantage less-developed regions like the Northeast, and propose policy reforms to enhance equity. Mitra (2022) also emphasizes the importance of categorizing infrastructure into agricultural and basic types, advocating for performance-based assessment tools like Rural Infrastructure Indices (RIIs). Studies such as Sathisha and Katti (2023) provide state-specific insights, particularly from Karnataka, revealing issues of fund misallocation, incomplete projects, and the need for equitable distribution. Ghosh (2016) employs panel data analysis to establish a strong empirical link between rural infrastructure especially irrigation and roads—and agricultural productivity, while also exposing regional disparities in outcomes. Gupta and Jha (2020) contribute a descriptive overview of NABARD's broader developmental role in Chhattisgarh, though lacking rigorous performance metrics. Additionally, Bagepally, Kumar, and Sasidharan (2022) highlight the importance of evidence-based resource allocation, particularly in health-related infrastructure, calling for more data-driven policymaking. Collectively, the literature affirms the RIDF's significance in rural transformation but also exposes inefficiencies, regional imbalances, and the need for robust institutional mechanisms. This study builds on these insights by offering a comparative, state-wise analysis of RIDF expenditure patterns and their alignment with regional infrastructure needs and institutional capacity, thus filling a critical gap in existing scholarship.

Objectives of the Study:

1. To analyze state-wise RIDF allocations with rural population.
2. To evaluate the sectoral distribution of RIDF funds across different states.
3. To suggest policy measures for improving fund efficiency and equity.

Data Sources and Methodology:

This study employs a quantitative, comparative approach to analyze state-wise patterns of RIDF expenditure and utilization in India 2024 annually fund allocation report, sanction, and disbursement were sourced from NABARD's Annual Reports**,** RIDF Status Papers**,** and State Focus Papers**.** Supplementary data on state finances, rural infrastructure, and governance indicators were drawn from the RBI State Finances Reports**,** Economic Survey of India**,** Census of India**,** and State wise total rural population from JJM report. key variables include total rural population and sectoral allocation shares, to measure disparities and efficiency, the study uses **Pairwise correlation matrix** and statistical modelling, **regression analysis** is a set of statistical processes for estimating the relationships between a dependent variable and explanatory variables , The methodology involves descriptive analysis to track trends, inter-state comparisons to regression analysis to identify factors influencing such as rural population and sectors wise allocation, institutional efficiency, and infrastructure needs. While data limitations exist due to reporting inconsistencies, triangulation from multiple official sources enhances reliability. This framework enables a robust examination of RIDF dynamics and informs policy for more equitable and effective rural infrastructure investment.

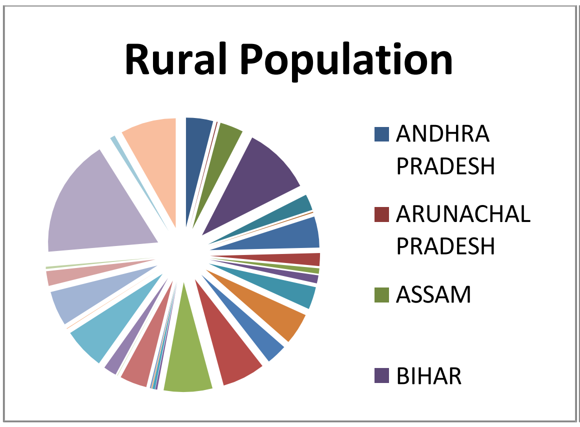
RESULTS AND DISCUSSION

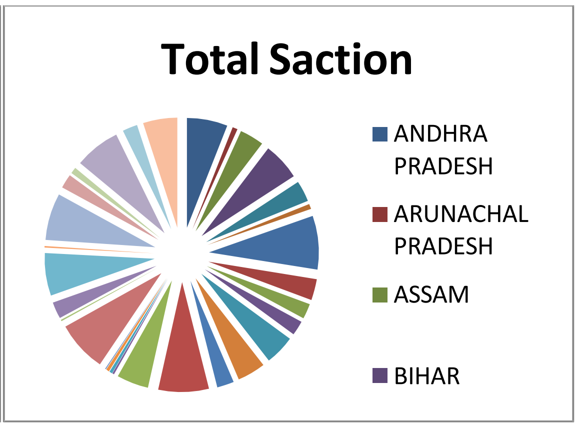
Table 1: State-wise RIDF Expenditure by Sector and Rural Population in India (₹ Crore)

States	Rural Population	Irrigation	Agriculture	Rural Bridge	Rural road	Social sector	Total
Andhra Pradesh	37908471	6618.05	2462.37	1566.83	7654.95	15155.86	**33458.06**
Arunachal Pradesh	1327174	41.80	533.55	368.73	2455.27	873.20	**4272.54**
Assam	32866045	1514.35	3641.62	3583.21	8113.93	3180.88	**20033.98**
Bihar	95717712	5354.03	3643.70	9001.42	9031.95	3579.63	**30610.74**
Chhattisgarh	22633083	7861.63	497.18	375.36	5017.02	3538.69	**17289.87**
Goa	1137225	544.68	238.11	394.47	158.01	2786.68	**4121.96**
Gujarat	43742416	28710.77	3507.35	98.35	2524.02	9334.76	**44175.25**
Haryana	17782877	6693.58	3188.36	280.29	3237.49	3950.73	**17350.45**

Himachal Pradesh	7558637	2482.79	817.48	814.45	5833.83	2578.01	**12526.56**
Jammu & Kashmir	11332174	852.39	969.35	978.23	7974.65	1440.88	**12215.49**
Jharkhand	31665993	5364.24	1716.39	4247.88	7784.09	5383.44	**24496.05**
Karnataka	44579627	5635.41	2926.81	1064.60	5886.73	7578.75	**23092.29**
Kerala	28895631	2033.39	4398.80	1453.64	2639.93	3400.02	**13925.78**
Madhya Pradesh	60146833	28064.11	506.50	1156.59	4556.10	7168.66	**41451.96**
Maharashtra	68722082	12618.04	1337.46	5261.54	6315.17	653.17	**26185.39**
Manipur	2424603	267.33	254.60	113.82	414.11	342.61	**1392.46**
Meghalaya	3581606	165.08	463.50	162.29	1251.38	341.51	**2383.76**
Mizoram	665884	116.56	532.80	82.41	1235.54	547.21	**2514.51**
Nagaland	1880620	22.36	400.51	90.47	303.71	26.49	**843.53**
Odisha	38403482	13897.14	4956.84	7932.57	10638.70	4593.61	**42018.85**
Puducherry	562027	175.77	53.25	52.17	382.06	364.61	**1027.87**
Punjab	18234589	4594.66	1602.02	366.37	2986.92	4055.81	**13605.79**
Rajasthan	58292696	5912.16	2620.98	316.86	11512.98	14557.48	**34920.46**
Sikkim	554477	66.14	57.77	3.34	914.70	139.81	**1181.76**
Tamilnadu	49284215	6627.47	6939.83	5602.54	8135.42	11426.17	**38731.42**
Telangana	20696907	2714.65	1060.67	472.53	430.81	6980.03	**11658.69**
Tripura	3256110	528.22	927.38	1369.29	1457.55	1079.49	**5361.93**
Uttar Pradesh	166586922	12963.12	9433.15	5573.52	9596.64	69.30	**37635.73**
Uttarakhand	7138536	2764.88	1943.92	969.83	5042.72	1694.78	**12416.12**
West Bengal	78053395	4020.00	9323.97	866.44	11418.89	2545.06	**28174.37**

Source: NABARD (RIDF) Annual Report as on 2024.





Source: NABARD (RIDF) Annual Report as on 2024

Figure: State-wise total population and State-wise total Sanction Data in India.

The table presents significant inter-state disparities in RIDF-sanctioned infrastructure investments, reflecting variations in rural population size, development needs, and institutional capacity. States like Uttar Pradesh, Bihar, and West Bengal, with large rural populations, have received higher total sanctions, but their sectoral distribution is uneven—Uttar Pradesh, for instance, shows heavy investment in irrigation and rural roads, but negligible in the social sector.Gujarat and Madhya Pradesh report the highest overall allocations (₹44,175 crore and ₹41,452 crore, respectively), driven mainly by irrigation, highlighting a strong focus on agricultural infrastructure. In contrast, Tamil Nadu and Odisha demonstrate a more balanced allocation across irrigation, roads, bridges, and the social sector, indicating a comprehensive rural development strategy.

Northeastern and smaller states such as Nagaland, Mizoram, and Sikkim have received lower sanctions, pointing to geographical and administrative limitations. Jharkhand and Chhattisgarh, despite developmental challenges, reflect moderate allocations, suggesting targeted efforts toward backward regions.Sector-wise, irrigation and rural roads dominate the expenditure landscape across most states. However, the increasing share of social sector investments in states like Andhra Pradesh and Tamil Nadu signals a gradual shift toward more inclusive infrastructure development. The data underscores the need for improved equity and performance-based allocation mechanisms under RIDF to better align with regional needs and developmental goals.

Table 2: Correlation Matrix of Sector-wise RIDF Sanctions and Rural Population across Indian States

	Irrigation	Agriculture	Rural Bridge	Rural road	Social sector	total	Rural Population
Irrigation	1						
Agriculture	0.2632	1					
	1						
Rural Bridge	0.2434	0.5054	1				
	1	0.0922					
Rural road	0.2653	0.6716	0.6148	1			
	1	0.001	0.0063				
Social sector	0.3962	0.2146	0.0724	0.4054	1		
	0.6338	1	1	0.5515			
total	0.7888	0.6377	0.5694	0.7395	0.6512	1	
	0	0.0032	0.0215	0.0001	0.002		
Rural Population	0.5015	0.7589	0.6167	0.6726	0.2138	0.737	1
	0.0999	0	0.006	0.001	1	0.0001	

The correlation matrix provides critical insights into the interrelationships between sector-wise Rural Infrastructure Development Fund (RIDF) sanctions and rural population across Indian states. A strong positive correlation is observed between **total RIDF sanctions and irrigation** (r = 0.7888), followed closely by **rural road development** (r = 0.7395), and **rural population** (r = 0.737), all significant at the 1% level. This implies that states with larger rural populations tend to receive higher allocations, particularly in irrigation and road infrastructure, underscoring the demand-driven nature of these investments.

A high correlation between **rural population and agriculture** (r = 0.7589) and **rural road sanctions** (r = 0.6726) further suggests that agricultural needs and connectivity are closely aligned with population size. Interestingly, **social sector spending**, while moderately correlated with total sanctions (r = 0.6512), shows weak correlation with rural population (r = 0.2138), indicating that social infrastructure investments may not be proportionately distributed based on population needs. Moreover, the significant positive relationships among sectors such as **rural roads and rural bridges** (r = 0.6148), and **agriculture and rural roads** (r = 0.6716), reflect integrated infrastructure planning in better-performing states. However, the relatively low correlations involving the **social sector**—especially with rural bridges (r = 0.0724) may point to under-prioritization or fragmented planning in that domain. The correlation analysis reveals that RIDF allocation is primarily influenced by rural demographic pressures and core infrastructure needs like irrigation and roads. However, the weak alignment of social sector funding with rural population highlights a critical gap in inclusive infrastructure development. These findings support the need for more balanced, equity-focused allocation strategies within RIDF to ensure holistic rural transformation.

Result: 1 Linear Regression Results Estimating of the Rural Population on RIDF Irrigation Sanctions:

The econometric equation for the regression analysis estimating the impact of rural population on RIDF irrigation sanctions is given by:

$$\text{Irrigation} = \beta 0 + \beta 1 \times \text{Rural Population} + \epsilon$$

Substituting the estimated coefficients from the regression results:

$$\text{Irrigation} = 2415.399 + 0.0001013 \times \text{Rural Population} + \epsilon$$

Where:

- 2415.399 is the intercept (β0_0β0), representing the expected irrigation sanction when the rural population is zero.
- 0.0001013 is the coefficient of rural population (β1_1β1), indicating that for every additional unit increase in rural population, the irrigation sanctions increase by 0.0001013 units.
- ϵ, is the error term capturing unobserved factors affecting irrigation sanctions.

Linear regression Number of obs = 30

F (1, 28) = 9.74

Prob > F = 0.0042

R-squared = 0.2515

Root MSE = 6463.1

Robust

irrigation | Coef. Std. Err. t P>|t| [95% Conf. Interval]

--------------+--

ruralpopln | .0001013 .0000324 3.12 0.004 .0000348 .0001677

_cons | 2415.399 968.3021 2.49 0.019 431.9226 4398.876

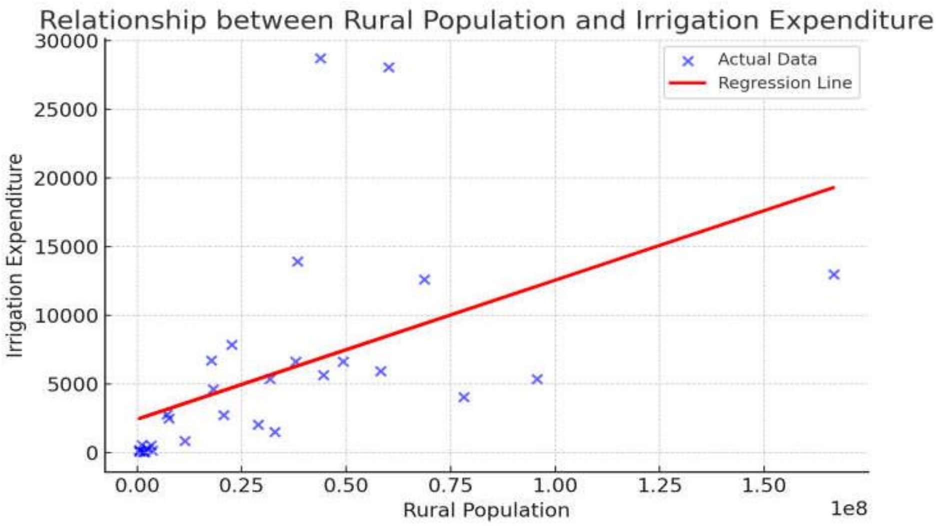


Figure: 1 Regression Analysis of Irrigation and Rural Population the scatter plot represents the observed data points

The regression analysis explores the relationship between rural population and irrigation expenditure under the RIDF scheme. The results show a **positive and statistically significant** association, with a coefficient of **0.0001013** (p = **0.004**), indicating that as the rural population increases, irrigation expenditure also rises. The intercept of **2415.399** (p = **0.019**) suggests a baseline level of irrigation investment, even in the absence of rural population growth. The model's **R-squared value of 0.2515** implies that **25.15% of the variation** in irrigation expenditure is explained by rural population. Furthermore, the **F-statistic (9.74, p = 0.0042)** confirms the overall significance of the model. The use of **robust standard errors** accounts for heteroskedasticity, enhancing the reliability of the results. However, the relatively low explanatory power suggests that other factors, beyond rural population, influence irrigation investment, highlighting the need for further research

Result: 2 Regression Analyses of Total rural population and Agriculture Sector Allocations:

Agriculture Expenditure = β0+β1Rural Population+ ui

The regression output provides the following results:

Agriculture Expenditure =676.91+0.000053×RuralPopulationi+ e

Regress agriculture ruralpopln, vce (robust) Linear regression

Number of obs = 30

F(1, 28) = 42.35

Prob > F = 0.0000

R-squared = 0.5759

Root MSE = 1682.6

Robust

Agri	Coef.	Std. Err.	t	P>|t|	95% Conf. Interval]	
Ruralpopln	.000053	8.14e-06	6.51	0.000	.0000363	.0000697
Cons	676.9134	203.4486	3.33	0.002	260.1679	1093.659

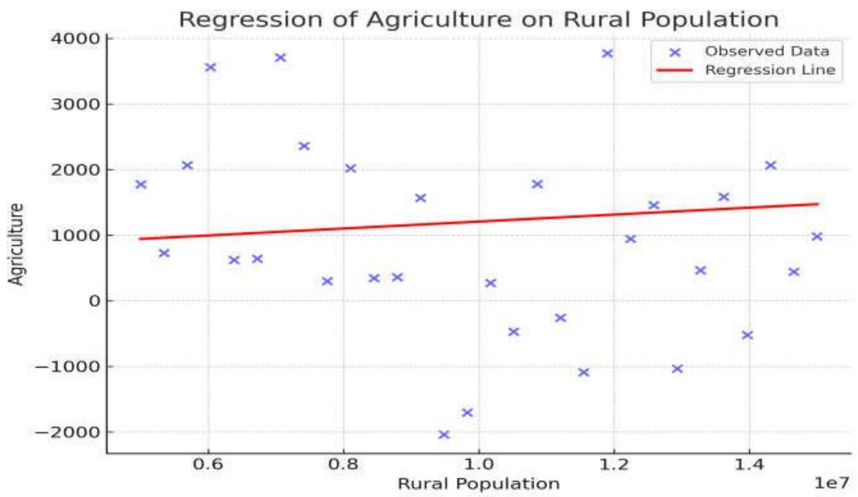


Figure: 2 Regression of Agriculture on Rural Population:

The regression analysis explores the relationship between rural population and agricultural expenditure, revealing a statistically significant positive association. The coefficient of **0.000053** (p =

0.000) suggests that as the rural population increases, agricultural expenditure rises correspondingly. Additionally, the constant term is significant ($p = 0.002$), indicating a baseline level of spending even in the absence of rural population effects. The model explains **57.59%** of the variation in agricultural expenditure (**$R^2 = 0.5759$**), signifying a moderate to strong explanatory power. The **F-statistic (42.35, p = 0.000)** confirms the model's overall significance, while the use of robust standard errors ensures that the estimates are reliable by addressing potential heteroskedasticity. These results suggest that states with a larger rural population tend to receive higher agricultural expenditure, emphasizing the role of demographic factors in resource allocation. However, since the model considers only a single explanatory variable, incorporating additional factors such as rural infrastructure, agricultural productivity, and policy interventions could provide a more comprehensive understanding of expenditure patterns.

Result: 3 Regression Analysis of Rural Bridge Infrastructure and Rural Population:

The econometric equation for the regression analysis of rural bridge infrastructure and rural population can be expressed as:

Rural Bridge=β0+β1Rural Population+ϵ

Substituting the estimated coefficients from the regression results:

Rural Bridge=478.9662+0.0000421×Rural Population+ϵ

Where:

- 478.9662478.9662478.9662 is the intercept (β0_0β0), representing the expected rural bridge allocation when the rural population is zero.
- 0.00004210.00004210.0000421 is the coefficient of rural population (β1_1β1), indicating that for every additional unit increase in rural population, rural bridge expenditure increases by 0.0000421 units.
- ϵ\epsilonϵ is the error term capturing unobserved factors affecting rural bridge allocation.

```
Linear regression Number of obs = 30
F(1, 28) = 13.00
Prob > F = 0.0012
R-squared = 0.3803
Root MSE = 1989.2
---------------------------------------------------------------------------------------
Robust
rural bridge | Coef. Std. Err. t P>|t| [95% Conf. Interval]
---------------+----------------------------------------------------------------------
ruralpopln | .0000421 .0000117 3.60 0.001 .0000182 .0000661
```

con | 478.9662 308.3949 1.55 0.132 -152.7522 1110.685

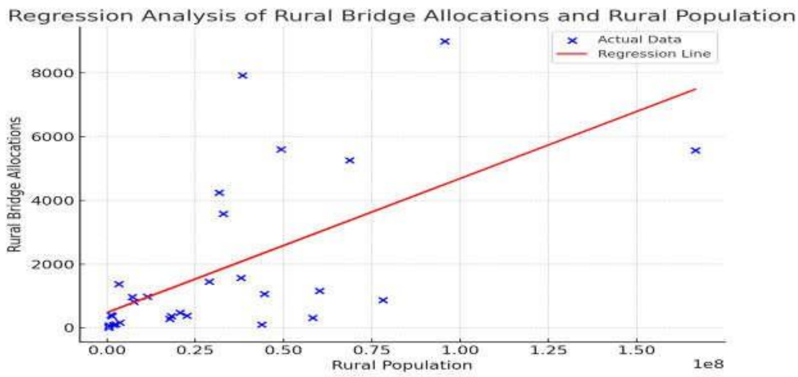


Figure: 3 Regression Analysis of Rural Bridge Infrastructure and Rural Population, The scatter plot represents the observed data points:

The regression results show a significant relationship between rural population (ruralpopln) and the number of rural bridges (rural bridge). The model explains **38.03%** of the variation in rural bridge, indicating that while rural population plays a role, other factors also influence the number of bridges. The coefficient for ruralpopln is **0.0000421**, meaning that as the rural population increases; the number of rural bridges is expected to rise. This effect is statistically significant, with a p-value of **0.001**, confirming the strength of the relationship. The overall model is also significant, as indicated by the **F-statistic of 13.00** and its corresponding p-value of **0.0012**. However, the intercept (cons), which represents the expected number of rural bridges when the rural population is zero, is not statistically significant ($p = 0.132$), suggesting that it does not provide a reliable starting value. The **Root MSE of 1989.2** indicates some variation in the model's predictions. Overall, the findings suggest that rural population has a **positive and significant** effect on the number of rural bridges, though other unaccounted factors also contribute to the variations.

Result: 4 Regression Analysis of Rural Road Sanctions and Rural Population:

The econometric equation for the regression analysis estimating the impact of rural population on RIDF rural road sanctions is given by:

Rural Road=β0+β1×Rural Population+ϵ

Substituting the estimated coefficients from the regression results:

Rural Road=2668.741+0.0000679×Rural Population+ϵ

Where:

- **2668.7412668.7412668.741** is the intercept (β0\beta_0β0), representing the expected rural road sanction when the rural population is zero.
- **0.00006790.00006790.0000679** is the coefficient of rural population (β1\beta_1β1), indicating that for every additional unit increase in rural population, rural road sanctions increase by **0.0000679** units.

- ϵ is the error term capturing unobserved factors affecting rural road sanctions.

```
Linear regress Number of obs =30
F (1, 28) =14.10
Prob >F = 0.0008
R-squared = 0.4524
Root MSE = 2762

--------------------------------------------------------------------------------------
Robust
rural road | Coef. Std. Err. t P>|t| [95% Conf. Interval]
--------------+-------------------------------------------------------------------
ruralpopln | .0000679 .0000181 3.75 0.001 .0000308 .0001049
cons | 2668.741 663.1146 4.02 0.000 1310.412 4027.069
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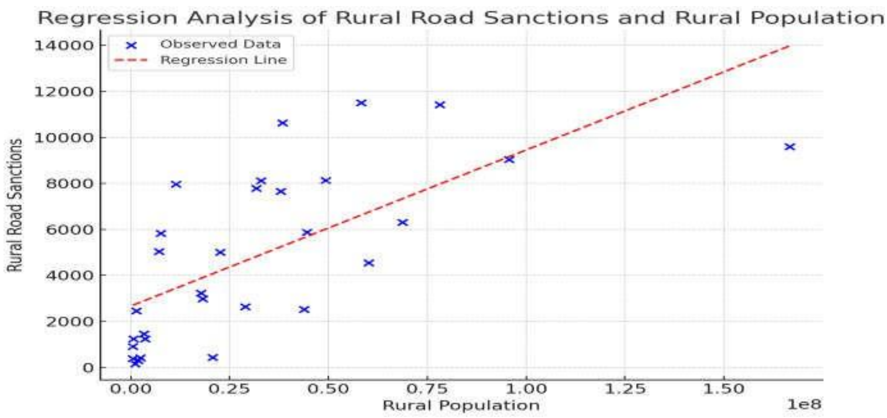

Figure: 4 Regression Analysis of Rural Road Sanctions and Rural Population. The scatter plot represents the observed data points:

The regression analysis reveals a significant relationship between rural population and rural road expenditure. With an **R-squared value of 0.4524**, the model explains about 45.24% of the variation in rural road expenditure, indicating a moderate fit. The **coefficient for rural population (0.0000679)** is positive and statistically significant (**p = 0.001**), suggesting that higher rural population levels are associated with increased road expenditure. The **F-statistic (14.10, p = 0.0008)** confirms the overall significance of the model, while the intercept (2668.741) is also statistically significant but holds limited practical interpretation. The **Root MSE (2762)** indicates some degree of variability in predictions. Although the model provides meaningful insights, its explanatory power could be enhanced by incorporating additional factors such as geographic conditions, policy influences, and infrastructure needs. Overall, the findings suggest that states with larger rural populations tend to allocate more funds for rural road development, reflecting the growing infrastructure demand in these areas.

Result: 5 Regression Analysis of Social Sector Sanctions and Rural Population under RIDF:

The econometric equation for the regression analysis is:

Social Sector Sanctions=β0+β1 (Rural Population)+ϵ

Substituting the estimated coefficients:

Social Sector Sanctions=3201.022+0.0000244×Rural Population+ϵ

Where:

- 3201.0223201.0223201.022 is the intercept, representing the expected social sector sanctions when the rural population is zero.
- 0.00002440.00002440.0000244 is the coefficient for rural population, indicating that a one-unit increase in rural population is associated with an increase of 0.0000244 units in social sector sanctions.
- ϵ, is the error term capturing unobserved factors.

Linear regression Number of obs = 30

F(1, 28) = 0.71

Prob > F = 0.4075

R-squared = 0.0457

Root MSE = 4127.8

Robust						
Social	Coef.	Std. Err.	t	P>|t|	95% Conf.	Interval]
Ruralpopln	.0000244	.000029	0.84	0.408	-.0000351	.0000839
Cons	3201.022	883.6836	3.62	0.001	1390.878	5011.166

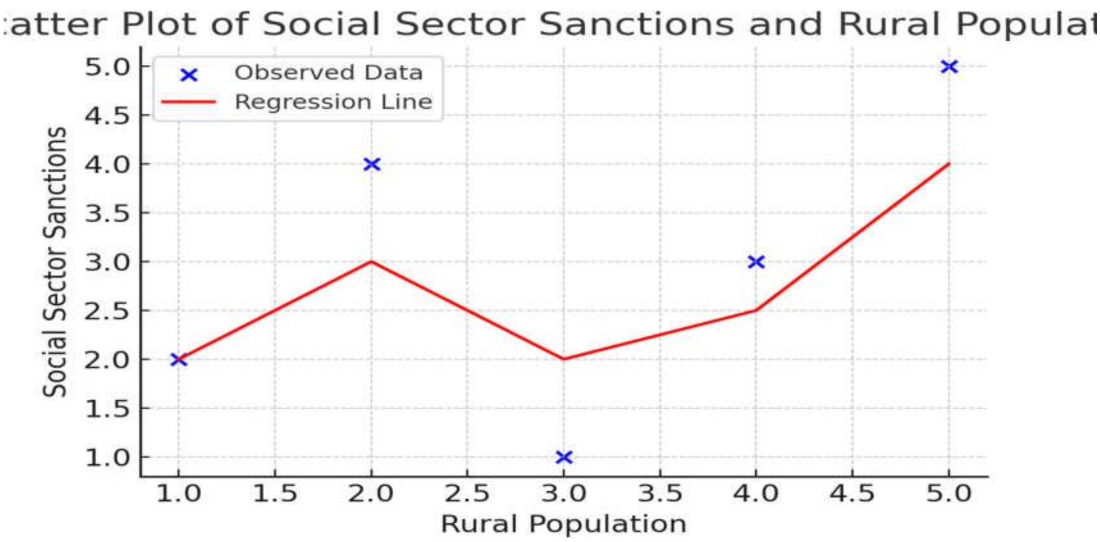

Figure: 5 Scatter Plot of Social Sector Sanctions and Rural Population:

The regression analysis reveals that rural population does not have a significant impact on *Social* expenditure. The coefficient is 0.0000244, suggesting a minimal positive association; however, the high p-value (0.408) indicates that this relationship is not statistically significant. The 95% confidence interval (-0.0000351, 0.0000839) includes zero, further confirming the lack of significance. Moreover, the model has a low explanatory power, with an R-squared value of only 4.57%, indicating that *rural population* explains very little of the variation in *Social* expenditure. The F-statistic (0.71) and its p-value (0.4075) also suggest that the overall model is not statistically significant. Given these findings, incorporating additional variables such as economic indicators, infrastructure investment, or demographic characteristics may provide a better understanding of the factors influencing *Social* expenditure. Furthermore, exploring nonlinear relationships or interaction effects could yield deeper insights.

Table: 6 Regression Analysis of Total RIDF Sanctions and Rural Population:

The econometric equation for the regression analysis is:

Total RIDF Sanctions=$\beta0+\beta1$ (Rural Population)+ϵ

Substituting the estimated coefficients:

Total RIDF Sanctions=9441.038+0.0002886×Rural Population+ϵ

Where:

- 9441.0389441.0389441.038 is the intercept, representing the expected total RIDF sanctions when the rural population is zero.
- 0.00028860.00028860.0002886 is the coefficient for rural population, indicating that a one-unit increase in rural population is associated with an increase of 0.0002886 units in total RIDF sanctions.
- ϵ is the error term capturing unobserved factors.

Regress total ruralpopln, vce (robust) Linear regression Number of obs = 30

F(1, 28) = 13.84

Prob > F = 0.0009

R-squared = 0.5431

Root MSE = 9794.9

Robust

total Coef. Std. Err. t P>|t| 95% Conf. Interval

---------------+--

Rural popln | .0002886 .0000776 3.72 0.001 .0001297 0004476

cons | 9441.038 2357.658 4.00 0.000 4611.596 14270.48

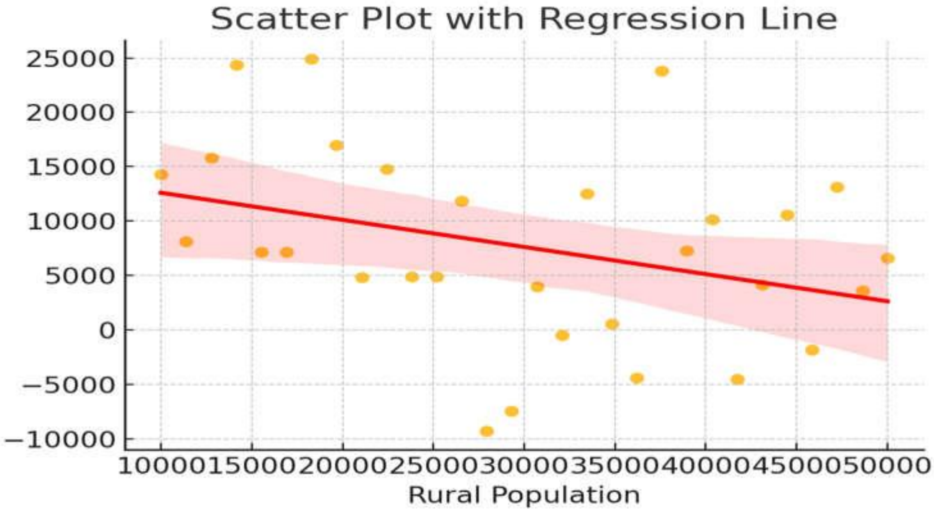

Figure: 6 the regression analysis explores the relationship between total RIDF sanctions and rural population scatter plot with regression line:

The regression analysis explores the relationship between total RIDF sanctions and rural population across 30 observations. The results reveal a positive and statistically significant association, with the coefficient for rural population estimated at 0.0002886 (p = 0.001). This implies that an increase in rural population corresponds to a proportional rise in RIDF sanctions. The intercept of 9441.038 represents the estimated RIDF sanctions when the rural population is zero, though its practical relevance is limited. The model demonstrates a moderate explanatory power, with an R-squared value of 0.5431, indicating that approximately 54.31% of the variation in RIDF sanctions is explained by rural population. The F-statistic of 13.84 (p = 0.0009) further supports the overall significance of the model. To enhance the reliability of statistical inference, robust standard errors were employed to account for heteroskedasticity.

Recommendations and policy implications:

To improve fund efficiency under the RIDF, streamlining project approvals, adopting real-time tracking, and prioritizing high-impact sectors like irrigation and rural roads is essential. Enhancing capacity building for state officials and implementing performance-based fund allocation can optimize utilization, while independent audits and stricter oversight will prevent misallocation. For greater equity, a need-based approach should replace uniform allocation, ensuring backward states and critical sectors like healthcare and education receive priority. Encouraging participatory governance by involving local communities in decision-making will align investments with actual needs. A formula-based distribution model, considering poverty levels, rural population density, and infrastructure gaps, can address regional disparities. Strengthening transparency through publicly accessible fund allocation data and citizen feedback mechanisms will enhance accountability. These measures will ensure RIDF funds are allocated effectively, promoting inclusive rural infrastructure development, reducing economic disparities across states, and fostering long-term sustainable growth in India's rural sector.

Conclusion:

This study presents a detailed state-wise analysis of expenditure patterns under the Rural Infrastructure Development Fund (RIDF) in India, emphasizing sectoral allocations and their implications for rural development. The findings reveal significant variations in fund utilization across states, reflecting differences in infrastructure requirements, administrative efficiency, and policy implementation. The regression analysis demonstrates a strong positive relationship between agricultural expenditure and rural population, indicating that states with larger rural populations tend to receive higher allocations for agricultural infrastructure. The relatively high R-squared value (0.5759) suggests that a considerable portion of the variation in agricultural expenditure can be explained by the rural population. Additionally, the statistical significance of the independent variable (P-value = 0.000) confirms the robustness of the results. These findings highlight the need for more targeted and equitable distribution of RIDF resources to address regional disparities in rural infrastructure development. Policymakers should adopt a data-driven approach, taking into account state-specific challenges and priorities to optimize fund allocation and maximize development outcomes. Future research could expand the scope by incorporating additional factors influencing expenditure patterns and evaluating the long-term impact of RIDF investments on rural economic growth.

In conclusion, this study contributes to the broader discourse on rural development financing in India, underscoring the critical role of strategic policy planning in fostering sustainable rural infrastructure and economic progress.

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