



iJRASET

International Journal For Research in
Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 12 **Issue:** X **Month of publication:** October 2024

DOI: <https://doi.org/10.22214/ijraset.2024.64509>

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The Impact of Decentralization on Economic Development in India

Aaryan Raghunathan

British International School Ho Chi Minh City, Vietnam

Abstract: A common occurrence in India, district splitting is said to lead to better developmental outcomes because it creates a population that is more homogenous and closer to its administrative unit. However, this relationship requires examination and to explore the effects of district splitting a difference in discontinuities approach is used with data from Washim, Karnataka, where differences-in-differences and regression discontinuities are combined to assess the change in night-light data, as it is a suitable proximity measure for economic growth, as well as the change in the number of schools per capita at the village level. It has been found that district splitting has little effect on economic growth. However, over time this trend may change because it has also been found that district splitting increases the number of schools per capita, which in the long term may lead to a more skilled and knowledgeable population that will result in economic growth.

I. INTRODUCTION

What is the optimal size of an administrative unit for efficient operations in a geographical region? This is a question that all governments across the world strive to answer.

It is widely accepted that geographically smaller, decentralized administrative bodies, each operating within certain borders, tend to be more effective than central federal bodies. In this regard, there is greater symmetry of information because the smaller the geographic coverage of an administrative body, the smaller a population, and so the more homogenous the population tends to be. As a result, it is easier for administrative units to design their mechanisms - such tax and transfer payment schemes - to raise welfare (Oates,1972). A more homogeneous population also creates a similarity in the requirement for public services (Rajan and Malghan,2022), thus allocative efficiency would increase as resources would be allocated in a way in which the majority of the population is satisfied.

Governments are convinced that district creation by district splitting is the best way to create a homogeneous population and reap the consequent benefits. Each new district created by a district split features its own, newly established, administrative unit that caters to a smaller population that is in a closer proximity to the administrative institution.

While district splitting has its benefits, there are also some notable costs that must be considered. The main cost is a loss of macroeconomic control (Bahl, 2007) as decentralization adds more layers of bureaucracy and this reduces the flexibility of central governments when reacting to changes in the economy such as increasing federal taxes as a countermeasure to rising inflation. Furthermore, district splitting creates a greater amount of individuals being in a position of power and influence, and this is not always a good thing. When conducting a study on the effects of administrative decentralization in China (Gong, Liu, and Wu,2021) found that in areas with weak federal supervision government funds can be diverted and used towards illegal purposes due to corruption.

Given that district splitting has many benefits, but also many potential costs, it becomes important to examine the effects of district splitting, which is what this paper sets out to do especially since countries such as India that have high levels of diversity may benefit greatly from district splitting. With over 1600 languages, 8 different religions, and 1.4 billion people spread across 28 states and more than 750 districts, India is one of the most socially diverse countries in the world. Along with social diversity, economic diversity is also widely present across India: there are vast disparities in income, education, and access to basic amenities such as healthcare and sanitation (Edukemy, 2023).

As mentioned earlier, a more homogenous population makes it easier for the deployment of public goods to be allocatively efficient as there is a societal similarity in the need for certain public goods. Effective deployment of public goods is crucial for development as they not only raise the standard of living of a society, but also act as an input to productive capacity (Besely and Ghatack,2024) which can lead to economic growth. Administrative decentralization can create this societal similarity amongst a population through district splitting, and thus allow districts to see greater development.

However, current India centric research focuses on the broader effects of decentralization, and mainly on government revenue, government spending and the consequent developmental outcomes. *Decentralization and its impact on Growth in india*, suggests that fiscal decentralization can lead to enhanced efficiency when deploying government resources, and *Decentralization in India: Outcomes and Opportunities* discusses that an increase in social expenditure on public goods such as health care and education tends to increase as a result of administrative proliferation. In other words, it can be said that the impact of decentralization on government spending is two fold: greater and more efficient public goods deployment. This is mainly because there is more accountability amongst local governments as they are directly accountable to their constituents due to the lack of distance between them, resulting in the more prudent management of government funds (Koley and Mandal, 2019). Further, because district splitting creates increased public participation in the decision making process, it in turn creates a stronger demand for good quality public goods (Arkorful et al, 2020)

Along with evidence of greater *spending* on public goods, there is evidence that decentralization affects the *distribution* of public goods such as hospitals and schools. *Demographic and development outcomes of administrative proliferation* highlights that this is mainly due to public spending being distributed more evenly: there is more demographic inclusivity as the newly created districts have governments whose headquarters are closer to local populations which are homogeneously distributed.

With the aim of assessing the effects of decentralization on development and economic outcomes, this study assesses the district split of Ankola to Ankola and Washim in 1998 as the basis of its analysis. The geographical scope is limited to this district because it contains all the necessary data, unlike many other districts that contain discrepancies in their data. In addition, while there have been empirical studies on larger and more significant district splits, none have been done in this region of India and given India's wide geography it is important to assess the impact of district splitting by region.

Further, the empirical method used in this study is relatively novel and has not been used to assess the effects of splitting a district in India. The empirical strategy allows for addressing bias and causality, which many studies do not account for with their pre-post empirical strategies. This, combined with the previously unresearched geographical scope of Washim, is the main contribution of this study. This study is also one of the few that quantify the impact of district splitting to determine whether existing theory-based literature is accurate. Nonetheless, there is one key limitation of this paper is the geographical scope of Ankola (pre split), which is one district. Studying one district, where the data for it is primarily in the short term, has made it hard for the effect of the district split on economic growth to materialize, which is explained further on. Furthermore, the use of a single district split limits the generalizability of this study as there are socioeconomic, political and cultural conditions specific to Ankola. Finally, robustness checks cannot be performed as this study does not include multiple districts whose inclusion may result in outliers.

The remaining of the study is structured as follows: Background, literature review, methodology, findings, and conclusion

II. BACKGROUND: DECENTRALIZED GOVERNANCE AND DISTRICTS IN INDIA

Districts in India are starkly different and vary in size. This is why it was argued that each district needed its own governmental body due to the heterogeneous nature of them, and within these districts there can be differences present among the population as well. An example of this is Bihar, which contained interdistrict disparities in the access to public services amongst tribal and rural populations. Districts like these are prevalent all over India.

Recognising the need for another tier of government, a series of committees, the first being in 1959, made policy recommendations which shaped the way government power was decentralized into multiple tiers. In the context of this paper, the term "decentralization" refers to the creation of new districts. This is done by allocating a few subdistricts from a preexisting district towards a new district, this new district has its own administrative unit which acts as its local government; these new districts tend to be created by the state government without any intervention of the national government.

First, the Balwant Rai Mehta Committee recommended the implementation of "democratic decentralization" known as Panchayati Raj in 1958 (insightsonindia.net). They recommended that there would be:

- 1) A three-tier panchayat¹ system at the village, block (group of villages), and district levels
- 2) The village panchayats should be constituted with directly elected representatives
- 3) Planning and development should be entrusted to them
- 4) Adequate resources should be transferred to these bodies
- 5) Proper system should be put place in to realize the devolution of powers

¹ The word Panchayat refers to the third tier of government - a village council

However, the devolution of power based on this recommendation was not consistent, and varied between states.

Next, the Ashok Mehta committee - part of the Janata government - recommended the following in 1977:

- 1) Three-tier system should be replaced with two-tier system
- 2) A district should be the first point for decentralization
- 3) There should be official participation of the political parties
- 4) They should have compulsory powers of taxation
- 5) Regular social audit
- 6) Elections should be held within six months if Panchayati institutions are superseded
- 7) A minister for Panchayati raj should be appointed at the state
- 8) Zilla Parishad² should be executive body
- 9) Constitutional recognition to these institutions

While there was no federal policy implementation because of the collapse of the Janata government, Karnataka, West Bengal, and Andhra Pradesh did implement some of the Ashok Mehta's Committee's suggestions. (prepply,nd)

District level administration has only been made legally possible due to the 73rd and 74th amendments to the Indian constitution which were implemented in 24th April 1993 and 1st June 1993, respectively. (Drishtijudiciary, 2023). Now there are political bodies at the district, sub district, and village levels. When grouped together they are called Gram Panchayats and are the smallest unit of administration in India, with the district collector (DC) being the head of each Gram Panchayat (administrative unit).

III. LITERATURE REVIEW

When looking at the broader scheme of work on the impact of district creation, studies such as the Administrative Proliferation and Developmental Outcomes: Data from India, 2022 use district and subdistrict level data set that consists of metrics from the population census, often comparing metrics such as number of schools and number of healthcenters. One example of a district and village level data set is the Socioeconomic High-resolution Rural-Urban Geographic Dataset (SHRUG) data set as used in *Rural Roads and Local Economic Development* (Asher and Novosad, 2019). Night -time luminosity, for example, was seen as a proxy for economic activity ,as used in a study by Rajan and Malghan, 2022, as it is widely accessible, even in remote areas where economic data collection is sparse.

With regards to decentralization through district creation and economic growth in India, current *Fiscal Decentralization and Economic Growth: Evidence from Indian States* (Ganaie et al, 2018) suggests that fiscal decentralization can positively impact economic growth via enhanced efficiency of public service delivery and greater local investments. However, this depends on local government capacity to raise revenue. This is supported by *Fiscal Decentralization, Economic Growth, and Democratic Governance* (Martinez-Vazquez and McNab,1997), which highlights that for administrative decentralization to be effective, well designed intergovernmental transfers and revenue-raising capacities need to be developed in tandem to avoid regional disparities.

From this broader scope of work, this study focuses on the effects of decentralization on developmental outcomes on bordering villages. While neighboring districts can be different from each other, this analysis is based on the assumption that villages in close proximity with each other follow parallel trends as they can often share socioeconomic, cultural, and environmental characteristics. Thus, it is the district split that should cause a divergence in outcomes, and this change will be measured on villages on each side of the newly created border

The analysis on bordering villages will be done in a similar fashion to *The Historical State, Local Collective Action, and Economic Development in Vietnam* (Dell, Land, and Querubin, 2017) which uses a regression discontinuity (RD) analysis to compare developmental outcomes amongst villages at the border of North and South Vietnam. They assess the impact of different historical exposure to centralized administrative institutions and use RD analysis to suggest that areas historically governed by the Dai Viet state experienced better economic outcomes due to enhanced local cooperation and governance structures. This analysis is also similar to *Partial fiscal decentralization reforms and educational outcomes: A difference-in-differences analysis for Spain* (Salinas and Solé-Ollé, 2018) who use a difference in difference methodology to assess the effects of fiscal decentralization on educational outcomes in Spain.

Regression discontinuity and difference-in-difference methods are combined to create a difference-in-discontinuity analysis which will be explained later in this paper. The literature gap this study fills is the use of difference-in-discontinuity analysis in this context.

² Zilla Parishad: elected council at district level

IV. METHODS

A. Variables and Datasets

For purposes of analysis, the Socioeconomic High-resolution Rural-Urban Dataset on India (SHRUG) is used, which allows for the assessment the impact of district creation because it features highly geographically granular longitudinal data, with over 500,000 geographical units (Devdatalab,nd). The metrics that will be examined are the deployment of public goods and economic activity.

For public goods the change in the level of school construction at the village level will be examined using data from the population consensus, which is incorporated in the shrug database. Data from 1991, 2001, and 2011 will be used as this is the maximum range of data where the effect of the district split can be measured, the population consensus was not recorded in 2021 due to Covid-19.

To measure economic activity, night-time light (NTL) data is used as is demonstrated in *Night-Time Light Data: A Good Proxy Measure for Economic Activity?* (Lobo et al, 2015). NTL is a good indicator of economic activity as regions of higher economic activity tend to have more artificial light due to infrastructure, businesses, and residential areas. NTL data is often used as a proxy for economic growth because of a lack of accurate GDP reporting, especially in rural areas. The NTL data is incorporated in the SHRUG database. The dataset used in the database comes from the National Oceanic and Atmospheric Administration, through its Defense Meteorological Satellite Program (DMSP) which has been used to capture nighttime lights globally. It houses an Operational Linescan System (OLS) which is the source of the data, it is a sensor which can detect low levels of visible and near-infrared light. It captures light intensity data and converts it into digital number values that range from 0-63. The digital number values are calibrated to correct temporal adjustments, changes in cloud cover, angle differences between the satellite and the earth and more. Calibrated night light data is available in the SHRUG database and is calibrated using the method of *Global Urban Monitoring and Assessment through Earth Observation* (Elvridge et al, 2014). However, additional changes have been made to the luminosity values by measuring light intensity with $\log(1 + \text{Calibrated Value})$ as done in *Regional development through place-based policies: Evidence from a spatial discontinuity* to deal with negative values. The range of the NTL data is 1994-2013 as this is what is available in the SHRUG database.

B. Empirical Strategy

The underlying question this paper will strive to answer is if administrative decentralization, via district splitting, leads to better outcomes for both new districts. More specifically, economic activity and public goods expenditure.

There is a clear cutoff - which is needed in RD analysis - when assessing district splitting, which is the border between Ankola and Washim, and villages just on either side of the border are similar in all respects except the district split as Ankola stays the same but Washim gets its own administrative body. This is why the identification strategy is to only assess the effects of district splitting on bordering villages.

The difference-in-discontinuities approach is comprised of the following:

- 1) *Differences-in-differences*: Looking at outcomes before and after the district split in 1998 with bordering villages in Ankola acting as a control
- 2) *Regression Discontinuity design*: Only assessing outcomes on bordering villages along each side of the border

C. Economic Activity

To compare economic outcomes due to district creation, a a time series regression has been employed as proposed in *The Impacts of Local Control over Political Institutions*:

Evidence from State Splitting in India, in the estimating equation below

$$Y_{vdt} = \beta_0 + \beta_1 NEW_d + \beta_2 POST1998_t + \beta_3 NEW_d * POST1998_t + \beta_4 year_t + \beta_5 year_t^2 + \gamma_{vd} + \epsilon_{vdt} \quad (1)$$

Y_{vdt} is the economic outcome of village v in district d and year t . NEW is a dummy variable to indicate that the village is in a new state, $POST1998$ is another dummy variable indicating the year is after 1998, which was when the district was created. ϵ_{vdt} is the standard error, while in *Sam Asher and Paul Novosad's* specification, it is a clustered error - there were not enough errors to cluster at the village and sub district levels. γ_{vd} is a vector of village level control variables, it accounts for other factors that may influence night lights to isolate district splitting as the only factor contributing to a change in economic outcomes.

D. Public Goods (Schooling)

Data on the number of schools (public goods) is only available every decade as it is a part of the population consensus. Thus, a comparison of means estimator has been used, as proposed by *Regional Development through Place-Based Policies: Evidence from a Spatial Discontinuity* (Shenoy, 2017) for villages on either side of the Ankola-Washim border. The change in the mean number of schools per unit of population between 1991 and 2011 is identified using the following specification:

$$[Difference_{school}] = \beta_0 + \beta_1 NEW_d + \gamma_{vd} + \varepsilon_{vdt} \quad (2)$$

Where

$$[Difference_{school}] = \frac{\text{Total number of schools in 2011}}{\text{Population of the Village in 2011}} - \frac{\text{Total number of schools in 1991}}{\text{Population of the village in 1991}}$$

Unlike the data on nighttime lights, my data on the delivery of public goods has been clustered at the subdistrict level. Therefore, ε_{vdt} is the clustered error. β_0 is the baseline in the change in the mean number of schools of the control group. β_1 is the change in the mean number of schools per thousand people in the new villages (border villages in Washim). NEW_d is a dummy variable that indicates the village is a part of the new district

E. Mapping Ankola to Identify Border Villages

The district split this paper will be assessing is the split of the district of Ankola to Ankola and Washim in 1998. Changes in the previously discussed outcomes will be discussed in villages along the Ankola-Washim border before and after the district split and the India Village-Level Geospatial Socio-Economic Data Set (SEDAC,nd) has been used to identify them and download the shapefiles

To obtain the villages along the border of the two states, I have used QGIS (QGIS,nd) - an Open Source Geographic Information System software - as per (Shastry, 2020) and done the following:

- 1) Selected the district using the state and district code combination. Figure 1 shows how the district of Ankola looks pre split
- 2) The district was split in 1998: the new district of Washim was created with its own administrative body and this is shown in figure 2
- 3) Selected all the border villages on each side of the border, as shown in figure 3, and collect their village codes
- 4) Merged the village codes with the SHRUG database to obtain the unique shrid for each village. A shrid is an identifier to find the relevant data on a village. In this case population consensus and Nighttime Light Series

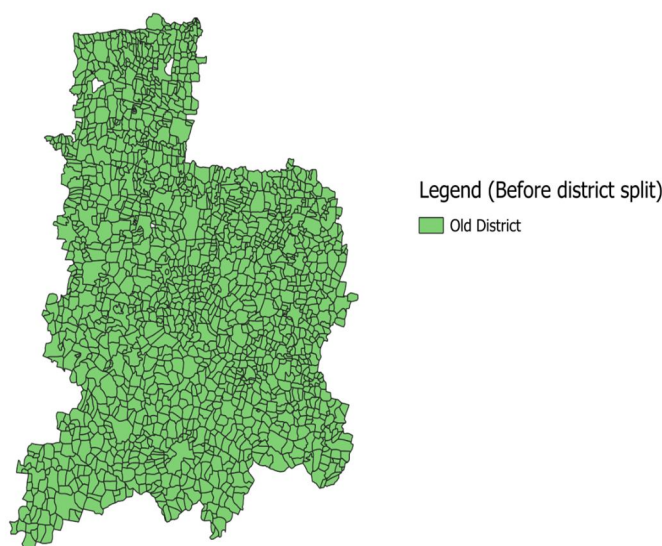


Figure 1: The district of Ankola before the 1998 split (qgis,nd)

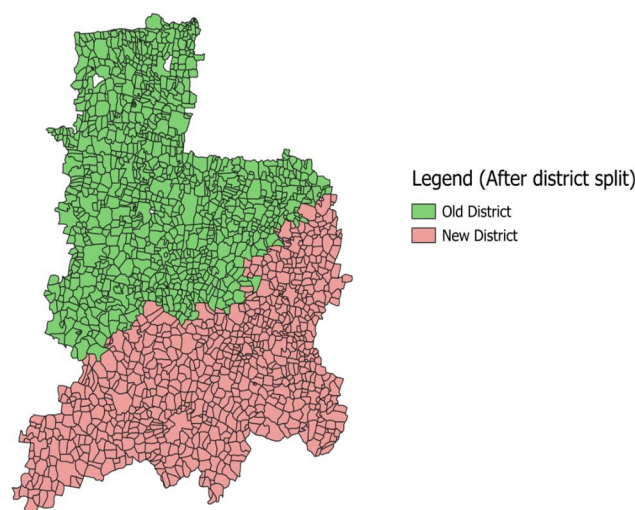


Figure 2: The district split, Washim was created with its own administrative unit (qgis,nd)

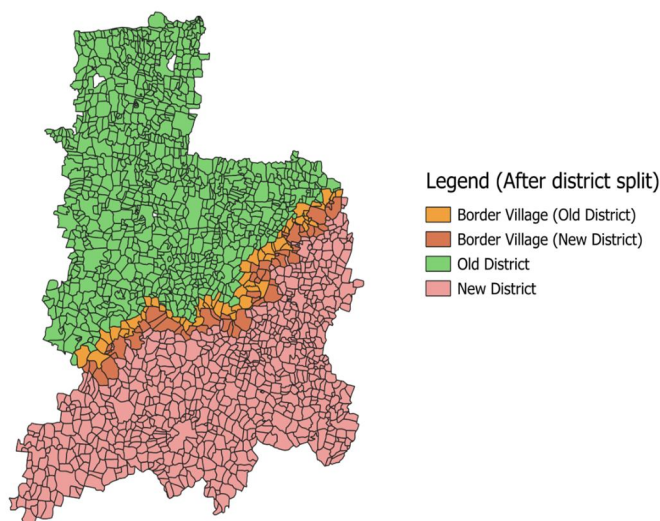


Figure 3: The bordering villages - I will be analyzing economic outcomes in these villages (qgis,nd)

V. FINDINGS

A. Economic Activity and Night Lights

When looking at the effects of district splitting on night lights, table 1 shows the estimates for equation 1. The results show that district splitting results in an increase in night light intensity of 0.04 log points, which is equivalent to a 4% increase. This 4% increase in light intensity translates to a 2.6% increase in output because according to *Measuring quarterly economic growth from outer space* (World Bank Blogs, 2022), a 1% increase in night light intensity suggests a 0.65% increase in GDP. The fixed effects model (column 2) highlights that this increase in light intensity is directly caused by district splitting. Overall, district splitting has a relatively meager affect on economic growth

Table 1

	(1) Night Light	(2) Night Light (f.e)
1 (Year>1998)*New District	0.04* (0.02)	0.04** (0.02)
New	-0.069 (0.04)	-
1 (year>198)	0.0355** (0.01)	-0.101*** (0.02)
Year	0.0243*** (0.00)	9.712*** (0.62)
Year ²	-	-0.00104*** (0.00)
Observations	2185	2185

Std Err statistics in parenthesis

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: The table presents the regression coefficients for the impact of district creation on night light output which is a proxy for economic activity. All the columns show the the effect of villages from 1994 to 2013. This table is self produced

B. School Construction

The second outcome this study has assessed is the delivery of public goods, more specifically schools per thousand people. The population consensus' from 1991 to 2011 have been used to identify changes in outcomes in bordering villages on the Washim-Ankola border. The results of the regression in equation 2 can be found in table 2 below. There has been a clear increase in the number of primary and middle schools per 1000, 0.44 and 0.52 respectively.

Table 2

	(1) Primary school	(2) Middle School	(3) Population
Estimate	0.44*** (0.11)	0.452*** (0.12)	372 (58)
Villages	115	115	115
Control Mean	-0.03	0.25	328

Std Err statistics in parenthesis

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: The table presents the regression coefficients for comparing the changes in the level of school construction from 1991 to 2011. Columns one and two show the change in the mean number of schools per 1000 in new and old districts. Column three shows the change in population during the same time period. All errors are clustered at the sub district level. This table is self produced

This clear increase in school construction is contrasted with economic activity. Unlike the delivery of public goods, there is no direct effect of decentralization on economic growth and there are many other factors which contribute to it. It is probable that economic growth will be a consequence of a more educated workforce (due to the increase in schools per thousand). More jobs will be created and the economies will move away from agriculture in the long term. Simultaneously, urbanization will happen and night light intensity will also increase. Agricultural economies tend to have lower night light intensity due to the nature of agricultural activities as complex infrastructure is not needed, so moving away from this type of economy should increase night light intensity.

VI. CONCLUSION

The creation of districts is a fairly common occurrence in India, with 22 new districts created between August 2023 and June 2024. This paper examined the split of the district of Ankola, in the state of Maharashtra, to Ankola and Washim in 1998. A difference in discontinuities estimator was used to identify any changes in economic growth and public goods provisioning. These outcomes were assessed in bordering villages on each side of the border. This identification strategy was used as it is based on the fact that villages along a border have comparable outcomes before the border is created and differing outcomes after.

It has been found that district splitting has a large effect on the deployment of public goods, using school construction as a proxy. The mean number of schools per thousand increases significantly between the years 1991-2011 on both the primary and middle school level.

Further, it has been found that district splitting has little effect on economic growth, using night light intensity as a proxy for economic growth. This is possible because of the agricultural nature of the economy and that as the villages become more industrial due to the jobs created because of a greater access to education, economic growth will happen in the long term.

As an extension to this study, future work can assess the impact of the increase in the number of schools in both districts. To do so, the total non-farm employment as a percentage of total employment could be studied, and this can be done using the SHRUG dataset as well. Additionally, the Night Light Data could be examined on a longer time frame, to assess if there is any long term impact of economic growth.

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APPENDIX

Variable	Old District	New District	Border Villages (Old)	Border Villages (New)
Village population (1991)	2236	2247	1946	1987
Share of scheduled tribes in population (1991)	4.81	4.53	3.31	4.12
Share of scheduled castes in population (1991)	17.3	18.1	18.4	17.9
Share of literate population (1991)	34.3	35.3	34.6	34.7
Share of primary schools per 1000 (1991)	1.24	1.25	1.21	1.38
Share of middle schools per 1000 (1991)	0.31	0.33	0.38	0.36

The table presents the mean values for some variables. The values presented are from the year 1991, before the creation of new districts. Column 1 shows the averages for all the villages that remained in the old districts. Column 2 shows the same for villages that would eventually become a part of new district. Column 3 and Column 4 show baselines statistics for border villages that will eventually become part of Old and New districts.



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