



## GEOGRAPHIC CONCENTRATION OF PRIMARY SCHOOL DROPOUT: EVIDENCE FROM NORTH-EASTERN REGION OF INDIA

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### ABSTRACT

**B**y using adjusted geographic concentration index the paper explores the geographic concentration of primary school dropout across states and districts of north-eastern region of India during 2008-09 to 2013-14. The analysis reveals that although in recent years the number of school dropout has declined within the region; its geographic concentration is found to be much higher across states and across districts of north-eastern region. Again, the extent of concentration has marginally increased during the study period except for the case of plain districts, and the concentration across districts is found to be higher than the concentration across states. Our findings also reveal that the territorial disparity of dropout rate largely affects the overall index values with a few exceptions and has increased considerably over the study period.

**KEY WORDS:** geographic concentration index, primary school, territorial disparity, dropout rate.

**JEL Classification:** I24, C43

### 1. INTRODUCTION AND BACKGROUND

Dropping out of children from primary school has become a challenging issue in the education system especially for developing countries where right to education through dropping out has been denied to about one thirty million children.<sup>1</sup> Like other developing countries, in India also more than 80 million out of 200 million enrolled students drop out before the completion of elementary education (UNICEF 2014). Even if most of the Indian states have successful in enrolling more children in school along with substantial increase in the number of primary and upper primary schools in the recent decades, a very large numbers of student continue to be out of school which is one of the key barriers in fulfilling the constitutional commitment to make

elementary education free and universal for all (Reddy & Sinha 2010).<sup>2</sup>

However, in the academic field several studies have demonstrated the extent to which higher level of school dropout adversely affect the socio-economic outcomes of a region (Sum et. al 2009, Rumberger 1987, Bjerck 2012, Musisi et. al 2003, Campbell 2015, Latif et. al 2015). There is, similarly, much research evidence on the influence of different socio-economic factors such as school related, individual related, or household related on school dropouts (Latif et. al 2015, Musisi et. al 2003, Guada & Sekhar 2014, Sabates et. al 2010, Govindaraju & Venkatesan 2010, Sabates et. al 2013, Gibbs & Heaton 2014). But, until quite recently much of the literature has tended to neglect the distributional pattern of dropouts, i.e., the extent to which the number of dropout is concentrated across different regions and what determines the overall



magnitudes of its concentration. Among the few exceptions are works by Andrei et. al (2011) and Vanderstraeten et. al (2012), who empirically examine the regional distribution of school dropout. This paper contributes to the existing literature by highlighting the variability of concentration of primary school dropouts across regions of north-east India.<sup>3</sup> This has important implications for policies specifically designed to reduce spatial inequality of school dropout.

Concentration of dropout is mainly the result of two factors – the first factor is related to the concentration of enrollment and the second factor is related to the regional disparity of dropout rate.<sup>4</sup>To be more precise, if the dropout rate is same in all regions, then the concentration of dropout would simply be the result of concentration of enrollment and, on the other hand, if the enrollment is same in all regions then the variability of dropout rates will entirely determine the extent of concentration of dropout.<sup>5</sup> Thus, it would be of prime interest to measure the effect of those factors on the regional distribution of school dropout. We use evidence from primary schools to see the disparity in concentration of school dropout within and across north-eastern states and to examines the trends in it over time. The contribution of this paper is to state the extent and nature of school dropout in north-eastern region by –

- ↳ Exploring the concentration of dropout within and across north-eastern states of India as measured by the adjusted geographic concentration index
- ↳ Providing measures to curb the regional disparity of dropout

## 2. DATA AND METHOD

Dropping To investigate the regional disparity of primary school dropout across states and districts of north-eastern region of India, secondary data regarding dropout and enrollment have been collected from DISE (District Information System for Education), managed by National University of Educational Planning and Administration (NUEPA) for the year 2008-09 and 2013-14.<sup>6</sup> But, the data on state/district area has been taken from Ministry of Development of North-eastern Region of India. The study has utilized the Adjusted Geographic Concentration (AGC) index proposed by Spiezia (2002) to find out concentration of dropout across states and districts of north-eastern region. This AGC index is very appropriate to find out regional concentration because it takes into accounts the size of different regions (geographical area) and corrects the problem of bias in aggregation of regional data.<sup>7</sup> The AGC index can further be decomposed into two components – effects of territorial disparity and the effects of geographic concentration. In case of dropout, the decomposed AGC index can be written as –

$$AGC = \sum_{i=1}^N \frac{y_i - p_i}{y_i - a_i} |y_i - a_i| + \sum_{i=1}^N \frac{p_i - a_i}{y_i - a_i} |y_i - a_i| \dots \dots \dots (1)$$

- Where,  $y_i$  indicates the share of dropout
- $p_i$  indicates the share of enrollment
- $a_i$  indicates the share of geographic area

The first term in equation (1) expresses the effect of territorial disparity of dropout rate and the second term expresses the effects of geographic concentration of enrollment.

## 3. EMPIRICAL ILLUSTRATION

### 3.1 Status of school dropout in north-eastern region of India during 2008-09 to 2013-14:-

Statistical summary of enrollment and dropout in different states and districts of north-eastern region during the period 2008-09 to 2013-14 for the primary level is given in table 1. Table 1 shows that for grade I both median values and the maximum number of enrollment in any individual state/district have sufficiently fallen during

the study period reflecting a gradual decline in the proportion of newly enrolled school-age children in this region. The total enrollment of the entire region has declined by 7.5% in the last five years. Grade I has witnessed the highest decline in enrollment which is nearly 14% followed by grade II (2.4%), while for grade III and grade IV enrollment have increased by 4.7% and 4.3% respectively. The maximum number of enrollment contained by an individual state increased for grade III and IV in the year 2013 which imposes an adverse effect on the overall AGC values for the state in terms of geographic concentration of enrollment. However, in most cases the highest number of enrollment declined for the district. It is worthwhile to mention here that in both the two periods the state Assam occupies the first position in terms of maximum number of enrollment for all the four grades, whereas in case of districts Dhubri and Nagaon districts of Assam interchangeably hold the same during the same period.<sup>8</sup>

**Table 1: Summary Statistics of Enrollment and dropout in North-Eastern Region of India**

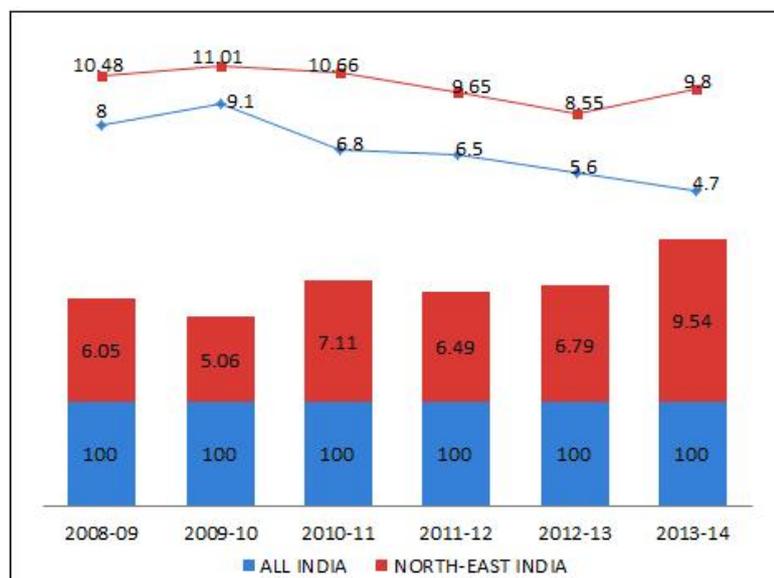
Category	North-Eastern States		North-Eastern Districts	
	2008-09 Med - Max	2013-14 Med - Max	2008-09 Med - Max	2013-14 Med - Max
Area (sq. km)	21704 - 83743	21704 - 83743	2842.5 - 10434	2580 - 11760
<b>Enrollment</b>				
<b>Grade I</b>	88483 - 1155104	67833 - 958267	9529 - 129990	9229.5 - 96519
<b>Grade II</b>	67548 - 862980	69103 - 836816	7245 - 85214	7878.5 - 79685
<b>Grade III</b>	58529.5 - 751616	66827 - 794914	6452 - 72745	7590.5 - 74315
<b>Grade IV</b>	53847.5 - 705697	61747 - 737158	5698 - 73188	7754.5 - 68864
<b>Dropout (%)</b>				
<b>Grade I</b>	16.84 - 30.9	12.39 - 32.63	19.45 - 61.2	13.4 - 50.2
<b>Grade II</b>	8.62 - 23.37	6.29 - 23.76	8.4 - 50.7	5.9 - 31.6
<b>Grade III</b>	9.06 - 15.37	5.69 - 25.77	6.2 - 56.7	5.55 - 36
<b>Grade IV</b>	5.41 - 12.09	6.14 - 21.58	4.4 - 52.9	4.35 - 36.9

Note: Data presented as Median - Maximum.

Source: Authors' calculation (based on state and district report cards of elementary education in India, 2008 and 2013)

Again the median values for grade II, III and IV for states and districts have increased during the same period indicating a fall in the number of out of school children in the successive grades. For the state the highest increase in median value of enrollment is observed for grade III which is 14.2% and for the district grade IV experiences the highest increase (36%). In case of dropout rate, a similar fashion has been observed. The median values of dropout have declined considerably for

the entire cases except for grade IV at the state level. The magnitude of decline in dropout at the district level is higher than that of the state level. While comparing the average number of dropout of north-east India with that of the all India average, over the years the rate of decline in the number of dropout is higher in all India level than the north-eastern region. Again, as a percentage of all India dropouts, the share of dropouts of north-eastern region have been increasing. This is shown in figure 1.

**Figure 1: Trends of dropouts of north-eastern region and India**

Note: Line diagram shows the average dropout rates in primary level and the bar diagram shows the percentage share of dropouts of north-east India (data sources are: elementary education in India state report cards for various years)

### 3.2 Adjusted geographic concentration:-

Table 2 explains the adjusted geographic concentration of primary school dropout across states and across districts of north-eastern region of India during

2008-09 to 2013-14. We computed the adjusted geographic concentration index separately for two broad cases: across macro regions (i.e., across total north-eastern states), and across micro regions (i.e., across total north-eastern districts, total north-eastern hilly districts and total north-

eastern plain districts). The average concentration for the primary level is found to be higher for micro regions than for macro regions in both the two periods. In all the cases, the effects of territorial disparities of dropout rate have increased considerably except for the case of plain districts, while the effect of geographical concentration of enrollment has declined for all cases. However, the magnitude of increase in territorial disparity is much higher than the magnitude of decline in the effect of concentration of enrollment, leading to an increase in the overall index values in all the three cases. It also reveals the fact that the factors influencing the territorial disparities of dropout rate are gradually diverging across states and districts. Although the average territorial disparity across total districts is found to be relatively higher, it has increased by more than 60 percentage point across total hilly districts during the same period. Again for individual grades also the effects of territorial disparities are comparatively higher in case of total districts in 2013-14 than the case of total states. Reverse is the case for total plain districts in which the territorial disparity shows a declining trend.

The impact of territorial disparity appears considerable. In all cases of 2008-09, on an average over 45 percent of geographic concentrations of dropout are due to territorial disparities in dropout rates which sharply

increase to over 60 percent in 2013-14. The share of territorial disparity appears highest in case of total districts followed by the case of total plain districts in 2013-14, although in the later case disparity declines considerably.

On the contrary, the overall concentration of enrollment shows a declining trend during the study period with a few exceptions. In case of total districts, the decline in concentration of enrollment is highest whereas the same has marginally increased in case of total plain districts. However, it is evident that the total number of enrollment for primary level has declined in all states except for Manipur. In absolute term, Assam has witnessed the highest decline in enrollment followed by Tripura and Arunachal Pradesh, and all these three states together constitute around 80 percent of total enrollment of the entire region. This fall in enrollment has considerably changed each state's relative share to total enrollment, leading to a decline in the effect of geographic concentration of enrollment. The same is also true for the all districts and for the hilly districts as well. However, for the case of Assam and Tripura, the creation of additional 8 districts from their erstwhile 27 districts with considerably boundary alteration adversely affects the distribution of enrollment across districts leading to a proportionate increase in the effect of concentration of enrollment.

**Table 2: Geographic concentration primary school dropout in north-eastern region of India**

Type of Concentration		Effect of Territorial Disparity of Dropout Rate		Effect of Geographic Concentration of Enrollment		Adjusted Geographic Concentration	
		2008-09	2013-14	2008-09	2013-14	2008-09	2013-14
<b>Total North-Eastern States</b>	Primary Total	<b>0.215</b>	<b>0.323</b>	<b>0.254</b>	<b>0.224</b>	<b>0.469</b>	<b>0.547</b>
	Grade I	0.136	0.245	0.376	0.115	0.512	0.36
	Grade II	0.204	0.317	0.273	0.373	0.477	0.69
	Grade III	0.175	0.267	0.247	0.289	0.422	0.556
	Grade IV	0.239	0.312	0.27	0.236	0.509	0.548
<b>Total North-Eastern Districts</b>	Primary Total	<b>0.273</b>	<b>0.417</b>	<b>0.246</b>	<b>0.173</b>	<b>0.519</b>	<b>0.59</b>
	Grade I	0.185	0.362	0.314	0.158	0.499	0.52
	Grade II	0.257	0.376	0.226	0.174	0.483	0.55
	Grade III	0.213	0.287	0.19	0.262	0.403	0.549
	Grade IV	0.216	0.356	0.271	0.112	0.487	0.468
<b>Total Hilly Districts</b>	Primary Total	<b>0.206</b>	<b>0.335</b>	<b>0.288</b>	<b>0.226</b>	<b>0.494</b>	<b>0.561</b>
	Grade I	0.172	0.292	0.323	0.151	0.495	0.443
	Grade II	0.232	0.346	0.3	0.235	0.532	0.581
	Grade III	0.186	0.276	0.189	0.223	0.375	0.499
	Grade IV	0.246	0.326	0.304	0.328	0.55	0.654
<b>Total Plain Districts</b>	Primary Total	<b>0.257</b>	<b>0.215</b>	<b>0.249</b>	<b>0.274</b>	<b>0.506</b>	<b>0.489</b>
	Grade I	0.179	0.164	0.283	0.301	0.462	0.465
	Grade II	0.229	0.216	0.232	0.217	0.461	0.433
	Grade III	0.207	0.183	0.189	0.203	0.396	0.386
	Grade IV	0.243	0.267	0.246	0.253	0.489	0.52

Source: Authors' calculation

#### 4. CONCLUSION AND POLICY IMPLEMENTA

This paper has focused on the regional concentration of school dropout in north-eastern region of India. The study of variability of regional concentration of dropout provides information to the government/policy makers about what kind of policy changes is required to reduce the number of dropout. We observed that the overall concentration has increased across different levels of aggregation which is largely influenced by the effect of regional disparity of dropout rate. It reveals the fact that although in recent years the total number of dropout has declined, its high concentration only in a few areas within the region considerably affects the socio-economic outcomes and in particular the health of school education system of those areas. Therefore, to lower the concentration of dropout, special attention should be paid to eliminate the regional variation of dropout rates or its effect of territorial disparity.

#### Notes:-

<sup>1</sup> See, for example, the "Economic Effects of Student Dropouts: A Comparative Study" by Latif et al (2015).

<sup>2</sup> Besides the objective of Universalization of Elementary Education (UEE), the Indian government has also joined in the global initiative on out-of-school children in 2010 to accelerate the goal of universal primary education by 2015 (for example, see, the "Global Initiative on Out-of-School Children UNICEF and the UNESCO Institute for Statistics," 2015).

<sup>3</sup> The north-eastern region of India comprises the following eight educationally backward states of the country: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. However, the state Mizoram able to retain its position within 10 spot in the education development index (EDI). Sikkim became officially a part of north-eastern region in 2002, which links the seven states on north-eastern region to the rest of India. The entire region consists of both plain and hilly areas with great ethnic, religious and socio-cultural diversity within and across states.

<sup>4</sup> The factors that affect regional variability of dropout rates are large enough. Besides the impact different socio-economic factors, dropout rate is largely affected by the environment or geographic barriers like drought, flood, migration etc. (Govindaraju & Venkatesan 2010, Musisi et al 2003). Generally people migrate from rural

to urban areas and, therefore, the number of dropout may be higher for regions which have a larger share of rural areas.

<sup>5</sup> The regional or territorial disparity varies with the size of regions. Generally, as the size of regions increases territorial disparities tend to decrease. This difference is also seen when we consider the extent of territorial disparities across states and across districts of north-eastern region.

<sup>6</sup> The total number of districts of all north-eastern states in the year 2013-14 has increased to 90 with the creation of additional eight districts (four from Assam and four from Tripura) from its erstwhile 82 districts.

<sup>7</sup> The Adjusted Geographic Concentration the geographic weight and the economic weight over all areas in a region and thereby overcome the limitation of concentration ratio which is basically depends on the number of areas/regions arbitrarily chosen for comparison.

<sup>8</sup> The state Assam contains more than 60% of total enrollment of the entire north-eastern region. Again the districts Dhubri and Nagaon contain around 18% of total enrollment of the state Assam.

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