Addressing Educational Disparity

Using District Level Education Development Indices for Equitable Resource Allocations in India

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Abstract

The challenge of development work in the social sector in India today is one of bridging huge disparities across regions of the country, gender and social groups. Unless national and state policies specifically target resources to address these disparities, achieving higher level outcomes in an inclusive manner, which is the real goal for human development in education and health, will be a distant dream. This paper takes up the case of the Indian government's Elementary Education for All Mission to understand how this flagship program relates investments to spatial and social disparities. For identifying the most deprived districts in terms of educational inputs, outputs and overall development, the authors estimate district level education development indices for 2003–2004. The contribution of the largest investment program is measured by "per child allocations" and expenditures at the state and district levels for 2005–2006. An analysis of comparing the ratio of allocations to expenditures with the ratio of district level indices to sub-dimensional indices shows that there is an apparent disconnect between the "real investment needs" of the districts, reflected in their level of educational development and the actual allocations made on an annual basis. The analysis shows that although all districts received more funds for investing in elementary education programs, the most disadvantaged and needy districts received proportionately more funds, which helped these districts to bridge access and infrastructure gaps and appoint more teachers. Benchmarking sector development by spatial entities helps not only in monitoring the outcomes, but also in targeting planning and funding to reduce disparities.

Addressing Educational Disparity:

Using District Level Education Development Indices for Equitable Resource Allocations in India

Dhir Jhingran[*] and Deepa Sankar[†‡]

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Introduction:

The challenge of development work in the social sector in India today is one of bridging huge disparities across regions of the country, gender and social groups. Unless national and state policies specifically target to address these disparities, achieving 'equality in outcomes', which is the real goal for human development in education and health will only remain a pipe dream. While inputs, in terms of financial resources and administrative attention, can alone not make a big impact, it is essential that policy and program designs in these crucial social sectors promote a strong equity oriented approach that ensures that regions and population groups that have been lagging behind receive much higher attention and resources. Providing a more equitable distribution of public resources and effort would be a prerequisite for bridging gaps in education, health and other key human development indicators. Persisting with an 'equal, non-discriminatory' approach towards investments and attention will not help us move towards achieving some degree of equality in outcomes.

This may seem quite logical and rational, but is often not included as a central piece of national or state policy and program designs. Apart from the commitment to equitable allocation of resources, one of the prerequisites of an equity-oriented approach to social sector investments is that there is strong commitment to making the planning in these sectors more evidence based. Improved targeting of resources and effort can happen only when reliable data is collected and analyzed regularly to understand: (a) the present situation of different regions and social groups on indicators reflecting key outcomes; (b) past trends in investments and outcomes; and (c) the gaps that need to be bridged in terms of key outcomes. This would help identify the kind of enhanced inputs and outputs required for areas and groups that are lagging behind enabling planners to make evidence-based decisions and preferential allocation of funds or design special interventions for specific pockets or groups. This is not to say that enhanced investments or improved design of schemes would directly result in improved outcomes. Outcomes in the social sector are the result of complex processes that need attention. These processes will need to be studied for translating outlays to some outcomes. The identification of key deficits and the recognition of the need for prioritized focused attention in some areas is the first step towards bridging disparities.

We took up the case of *Sarva Shiksha Abhiyan (*SSA- the Indian government's Elementary Education for All Mission) to understand how this flagship program relates investments to spatial and social group based disparities. The case study looks at the following questions:

(a) What are the disparities in key dimensions of educational development in India?

(b) How can objective indicators and composite indices be developed to clearly identify the situation of each geographic/administrative unit or social group;

(c) Is there any relationship between resource allocations and the status of educational disadvantage as evidenced by such indices?

(d) What measures can be taken to make social sector schemes more equity oriented so that they target reduction of disparities?

Some important questions sought to be answered in this paper, specific to the SSA program are: Has SSA been able to target resources in an equitable manner? Have states and districts that are educationally disadvantaged, in terms of infrastructure and first level outcomes like enrolment rates and gender or social group disparity in enrolment, been given preferential treatment in allocation of funds? Have these worse-off states and districts been able to make the most of the annual allocations made under SSA? Does the framework of SSA support and actively encourage a differentiated, equity- oriented planning and budgeting process that is able to discriminate positively in favor of educationally disadvantaged areas and groups? How can the equity orientation be improved further?

This paper is organized in the following sections: Section 1 discusses the financing of elementary education in India and a brief introduction of SSA. Section 2 outlines the nature of disparities in elementary education across the administrative units of states and districts. Section 3 explains the construction of an Educational Development Index (EDI) for this study[1]. Section 4 analyses the relationship between the financial investments under SSA in the early years of the Program and the state of educational development of states and districts by linking the EDIs and Per Child Allocations (PCA). Section 5 looks at some changes in policy and decision making process for allocating annual funds under SSA and their impact on the appropriateness of per child allocations (alignment with identified need based on EDIs). Section 6 provides some suggestions for improving the equity orientation of SSA and other Centrally Sponsored Schemes in India.

Section 1.

Financing of Elementary Education in India: Centrally Sponsored Schemes and SSA

India is a federation of 28 States (provinces) and 7 Union Territories. The States vary in their size, population and economic and human development indicators[2]. The Constitution of India clearly defines the role of Central government and State governments in policy and implementation matters. Subjects like education and health are in the Concurrent List of the Constitution, with both Central and State governments having the right to make legislation and invest in these sectors. However, conventionally, it is the State governments who deal with the major funding and provision of elementary education services.

Historically, State governments accounted for 80%-90% of all elementary education expenditures in the country. Expenditure on education accounts for around 18%-20% of the revenue expenditures and roughly around 2% of the capital expenditures of the State budgets (with wide variations across states, for example, Bihar spending 23% of its state budgets on education sector while Punjab spending only around 12% (for the year 2007-08)[3]. However, these figures camouflage other dimensions of education financing: (i) States vary in terms of their overall budgets, depending on their fiscal capacity, and hence a larger allocation to education does not mean larger funds to the sector[4]; and (ii) recurrent, non-plan expenditures, mainly salaries, account for 80%-90% of the education sector expenditures of the states, which means these expenditures do not result in developmental investments, but merely to sustain the existing system. Around 90%-95% of the non-plan expenditures of the states are spent on teacher salaries[5]. Complicating the state variations in terms of their fiscal capacity to allocate funds for education and their commitment is the wide variations in access to education facilities and the quality of infrastructure available. In order to address the inequalities across states in terms of fiscal capacity to invest in education and the varied educational outcomes of various states and to transfer funds vertically from Central to states as part of the sharing of resources, Central government started investing in several social sectors, mostly aimed at "plan" investments – or non-recurrent, investments in capital goods and services.

Centrally Sponsored Schemes

The Government of India (GOI), with the objective of providing additional targeted resources for the social sector including health, education, nutrition and poverty alleviation, has been pumping in significant quantity of funds through several Centrally Sponsored Schemes (CSS)[6] to the states. In the past decade, the number of CSSs has multiplied and in some sectors like health and education, these schemes constitute the bulk of the developmental (non-salary) expenditures of state governments. Support via the Union Ministries' CSSs has doubled over the last 20 years, increasing their share in the central plan allocations from one-third to a little less than two-thirds of the total in 2001-02 (Saxena; 2003). Thus CSSs play a key role in directing developmental expenditure in the social sector and hold the key to the bridging of disparities in human development.

Under the CSSs, while the Central government provides for a major share of the financing, the implementation is carried out by the state governments. In several schemes, the focus is on decentralized planning and implementation that could help in addressing specific contexts and provide a basis for more evidence based interventions and differentiated fund allocations based on 'real need'. The challenge for CSS has been to be able to align their guidelines to making prioritized allocation of limited resources in alignment with needs of states and districts as reflected through key indicators. Better 'targeting' of resources based on identified, evidence based need is really important since CSSs were originally designed as a measure of correcting vertical and horizontal imbalances in allocations in the social sectors.

Sarva Shiksha Abhiyan (SSA)

SSA, India's flagship program for universalizing elementary education aims at achieving universal enrolment and retention of children in the 6-14 years age group and bridging gaps in educational outcomes between regions, social groups and gender. The Program advocates a decentralized, contextualized and bottom up planning process that could result in the development of need based annual work plans that reflect the real requirement of each habitation, block and district and also the socially and educationally disadvantaged groups. The major components of SSA relate to school infrastructure, recruiting additional teachers, strategies for inclusion of vulnerable groups of children including those who are not attending school, improving the quality of education through training of teachers, revision of curriculum, improved supervision and greater accountability to the community.

Today, SSA provides for more than 90% of the funds for capital expenditure (though considered as "plan" expenditure in budget heads) in elementary education as well as for developmental activities crucial for improving the efficiency and effectiveness of the school system. The financing of SSA is designed as an "additionality" to the state governments' investments in the elementary education sector that are required to be maintained at 1999-2000 level, thus resulting in an overall increased investment in elementary education. The Program, therefore, has the responsibility of ensuring that this additional, crucial investment is directed correctly to reduce educational disparities across the country.

Section 2

Status of Educational Development and Disparities

India has made swift strides in the past decade in improving the availability and infrastructure of primary and upper primary schools and ensuring high enrolment rates among 6-14 year old children. The investment in elementary education by the Central and state governments have shown a significant increasing trend in the past five years. While state budgets for elementary education have increased by about 8-10% annually between 2001-02 and 2005-06, the central government's spending increased by more than 30% between 2001-02 and 2005-06, mainly on account of the hefty allocations for SSA and Mid-Day Meal Scheme (MDM) in the past two years.

Overall, there has been an impressive improvement in the school infrastructure since the inception of SSA in 2001-02. Since then, and up to 2008, nearly 1,40,000 new primary and upper primary schools have been opened, 6,00,000 additional classrooms have been constructed, 500,000 additional teachers have been appointed. About 60 million students receive free textbooks under the program each year and 3 million teachers receive an annual round of in-service training. The MDM program now provides a cooked meal to almost 120 million primary level students in government

schools and alternative education centers. In terms of first level outcomes, the number and proportion of children in the 6-14 years age group who are not attending schools has been steadily declining. From an estimate of over 32 million 'out-of-school' children (OOSC) in 2001, this number has reportedly declined to about 13 million children in 2005[7]. The gender gap in enrolment (difference in the proportion of boys and girls in total enrolment) at the primary stage declined from 12 percentage points in 2002-03 to 3 percentage points in 2007-08.

While the aggregate national level picture is definitely encouraging, there are large variations between states, between districts within a state and between blocks within a district with respect to availability of schools, especially upper primary schools, physical infrastructure of schools and the availability of teachers. Similarly there are huge disparities in enrolment rates, gender gap in enrolments across states and between districts within a state. The repetition rates of students at the primary and upper primary stages and the dropout rates that reflect the efficiency of the education system in retaining students and ensuring completion of primary/ upper primary level education also vary significantly across the country. Table 1 provides an overview of the inter-state and intra-state disparities for selected indicators relating to inputs and a few educational outcomes as on 2004-05.

Thus, districts across the country are at different levels in terms of educational infrastructure and outcomes. A similar analysis carried out for some districts of the country indicates that there are significant inter-block disparities in educational infrastructure and educational attainments (see Annex-I). *It is therefore a truism to say that the 'real' needs of different pockets in the country are very widely varying.*

Section 3

Education Development Indices (EDI)

A vital pre-requisite for identifying areas that are lagging behind educationally and for assessing the progress in covering deficits in such pockets is the existence of reliable databases at disaggregated levels that provide information on key indicators of educational development. While every indicator is important and useful individually, it is also important to have a "summation" of the multiple educational indicators at state/district/sub-district level in a country like India. However, the problems associated with the composition and validation of indices mostly relate to "which indicators to be included, what should constitute the most important elements, what are the possible proxies for the elements, how the indicators should be aggregated, what weights should be given to different fields while aggregating, and how the results should be interpreted and used".

State	Student classroom ratio (Primary grades)			Pupil Teacher Ratio (Primary grades)			Primary : Upper Primary school ratio			Out of school (6-14) %			Gender gap (Upper Primary)		
		Variations across districts within state			Variations across districts within state			Variations across districts within state			Variations across districts within state			Variations across districts within state	
	AVG*	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN	AVG	MAX	MIN
AP	31	39	24	28	34	22	2.53	3.54	1.77	3.6	8.1	0.4	5.3	15.1	0.2
Assam	55	107	20	32	85	8	3.25	4.61	2.2	11.3	18.2	4.9	3.1	7.4	0.3
Bihar	84	117	64	78	209	57	3.6	6.56	2.57	10.5	25.9	3.2	24.6	48.2	8
Chhattisgarh	36	46	23	38	50	24	3.19	5.34	2.2	9.9	33	2.2	9.5	26.3	3.7
Gujarat*	32	44	23	41	56	31	1.5	3.43	1.11	3.1	9	0.8	12.9	32.1	0.6
Haryana	47	68	34	43	50	34	2.08	8.48	1.42	6.2	15.7	1.2	2.4	16.1	1.3
HP	18	22	5	22	27	6	2.69	3.47	1.96	0.4	1.6	0	4.9	14.7	1.8
Jharkhand	53	81	34	60	89	42	3.79	5.33	2.63	6.8	20.5	1	15.8	37	2.8
Karnataka	26	39	17	46	169	27	1.97	2.77	1.39	2.1	5	0.5	4.5	13.1	0.9
Kerala	25	29	20	26	30	24	1.86	3.25	1.49	0.7	4.3	0.1	3.4	5.4	0
MP	42	322	27	37	77	18	2.8	5.72	1.76	3.0	12.2	0.3	15	35.8	3
Maharashtra	34	323	18	33	46	16	1.84	3.26	1.34	2.8	13	0.5	6.6	12.6	0.7
Orissa	32	42	24	40	60	31	2.88	4.62	1.68	3	7.5	1.1	8.5	26.2	4.3
Punjab	29	36	25	33	44	28	2.03	3.84	1.55	2.2	9	0.1	7.6	13	3.4
Rajasthan	32	101	19	40	62	11	2.82	6.65	1.67	2	15	0.4	26.4	58.2	8.5
TN	32	50	25	38	45	30	2.66	3.46	1.31	1.5	3.7	0.2	4.1	9.3	1.3
UP	62	85	41	73	131	46	3.63	7.73	2.11	6.4	16.2	0.9	11.2	36.7	0.6
Uttaranchal	25	44	17	28	41	19	2.94	3.99	2.48	0.5	0.9	0.1	4.6	12.6	0.6
West Bengal	56	106	32	49	72	34	5.3	7.64	2.84	4.7	19.5	1.3	2.8	20.7	0

Source: DISE (2004-05), PMIS, 2005

* AVG: Average; MAX: Maximum among districts; MIN: Minimum among districts

Internationally, UNESCO[8] compares the "Education for All Development Index (EDI)" for various nations, in which India figures at the 105th position among 127 nations in 2005 (UNESCO- GMR, 2004), but moved a couple of places up to be ranked 102nd among 129 nations (UNESCO- GMR, 2009). There have been various efforts to construct Education Development Indices (EDIs) in India. The Ministry of Human Resource Development (MHRD)-supported study in 1998-99 (GOI, 1999) and the Planning Commission-sponsored study conducted by the Institute of Applied Manpower Research (IAMR) (Yadav and Srivastava, 2005) are the two notable efforts in this context. Both studies endeavor to compare EDIs across states. All these estimations of EDIs, however, look at certain outcomes in education sectors, leaving out the process and inputs. These efforts were also limited at state level comparisons, which camouflaged variations within these states.

The effort towards developing district level educational development indices, and that too taking into account education development related indicators related to dimensions such as inputs and equity was carried out by Jhingran and Sankar (2006)[9] for the year 2003-04. For this particular analysis, separate indices were developed at district level for the status of various dimensions of education development as well as a consolidated "Education Development Index" (EDI) indicating the overall progress towards achievement of Universal Elementary Education (UEE). The EDI constructed for this analysis is a summation of the following indices—input index, equity index and outcome index.

The parameters used for this analysis and their definitions are described below.

(i) Input Index: This index sums up the different indices that describe the extent of inputs—both physical and qualitative—including those related to access, infrastructure and human resources, i.e. teachers. These indices are:

- *Access Index*: This summarizes the indicators related to primary school coverage (both in terms of area as well as the number of children in the age group of 6-10 years of age and the availability of upper primary schools (in comparison with primary schools). It includes coverage of the following:

  (a) Primary schools' coverage – an index using primary schools per 1000 child population of 6-10 years and number of primary schools per square km (thus adjusted for both area density and population density).

  (b) Ratio of the number of upper primary schools to primary schools.

- *Infrastructure Index*: This is an integration of indicators relating to the availability of classrooms, toilets and drinking water facility, at both the primary and upper primary levels. It covers the following:

  (a) Percentage of classrooms available against requirement
  (b) Percentage of schools with common toilets
  (c) Percentage of schools with drinking water facility.

- *Teacher Index*: The Pupil-Teacher Ratio (PTR) at the primary and upper primary levels together has been used for creating an index of teachers.

(ii) *Equity Index*: This index includes:

- Girls' age-specific enrolment ratio (as a percentage of the girls in the 6-14 year age group enrolled in school on the basis of the Census 2001 data).

- The female literacy rate of Census 2001 as a comparison to gauge the current level of girls' enrollment vis-à-vis the historical backlog.

(iii) Outcome Index: This index includes the following indicators relating to enrollment and completion rates:

- Percentage of children enrolled (6-14 years) – Household survey
- Enrollment in grade V/ Enrollment in grade I (Crude primary completion rate)
- Enrollment in grade VIII/ Enrollment in grade I (Crude elementary completion rate)

The EDI construction is structurally presented in Figure 1. The data used for this analysis were taken mostly from District Information System for Education (DISE), while some of the information was derived from Household Child Survey (SSA), Census 2001 etc.

Figure 1: Structural Representation of the EDI				
Dimension	**Indicator**	**Dimension Indices**	**Sub-EDI Indicators**	EDUCATION DEVELOPMENT INDEX
Access	Primary School Coverage	Access Index	INPUT INDEX	
	Primary: UP ratio			
Infrastructure	Classroom availability	Infrastructure Index		
	Toilets availability			
	Drinking water availability			
Teacher	PTR	Teacher Index		
Enrolment	% of 6-14 years in school	Enrolment Index	OUTPUT/ OUTCOME INDEX	
Completion	Primary school completion	Completion Index		
	UP completion			
Equity	Girls' enrolment	Equity Index	EQUITY INDEX	
	Female literacy			

Analysis of EDI status of states

Of the 19 major states considered for this analysis, Himachal Pradesh (HP) has the best input-related indices (especially the access- and teacher-related ones)[10], while Kerala has the better equity and outcome-related index compared to all other states. Overall, HP, Kerala and Uttarakhand top the EDI rankings. As expected, Bihar, Jharkhand and Uttar Pradesh (UP) figured at the bottom of the EDI rankings. However, within each state, various districts vary widely in terms of EDIs, rendering *an overall state level EDI quite meaningless*. For example in HP, the EDI of the best district is 0.77 while that of the worst district is 0.54. Similarly, within Bihar, the EDIs of the best and worst districts are 0.17 and 0.32, respectively. District level variations in EDI are the least in Kerala

wherein the best and worst districts have EDIs of 0.68 and 0.58, respectively (see Table 2).

Table 2. State Level Education Development-related Indices and the Worst and Best District Level Educational Indices within States											
	State Level Indices				District Level Indices – Indices of Best and Worst Districts						
					Input index		Equity index		Outcome index		EDI index	
	Input index	Equity index	Outcome index	EDI index	Worst	Best	Worst	Best	Worst	Best	Worst	Best
AP	0.51	0.16	0.70	0.56	0.25	0.46	0.09	0.65	0.49	0.83	0.34	0.57
Assam	0.60	0.50	0.28	0.45	0.21	0.43	0.48	0.78	0.30	0.58	0.28	0.51
Bihar	0.10	0.24	0.01	0.07	0.09	0.18	0.21	0.63	0.17	0.42	0.17	0.32
Chhattisgarh	0.31	0.43	0.27	0.30	0.20	0.27	0.09	0.74	0.16	0.60	0.18	0.45
Gujarat	0.50	0.65	0.56	0.54	0.27	0.40	0.53	0.81	0.32	0.69	0.37	0.55
Haryana	0.36	0.60	0.54	0.47	0.21	0.34	0.47	0.82	0.44	0.77	0.34	0.55
HP	0.73	0.81	0.90	0.82	0.31	0.74	0.68	0.88	0.69	0.92	0.54	0.77
Jharkhand	0.14	0.37	0.11	0.15	0.12	0.23	0.27	0.72	0.24	0.49	0.21	0.39
Karnataka	0.49	0.68	0.82	0.66	0.25	0.36	0.56	0.89	0.57	0.97	0.43	0.68
Kerala	0.56	0.91	0.99	0.79	0.32	0.40	0.82	0.96	0.77	0.97	0.58	0.68
Maharashtra	0.50	0.73	0.69	0.61	0.25	0.39	0.51	0.88	0.34	0.83	0.32	0.62
MP	0.32	0.59	0.61	0.48	0.16	0.30	0.31	0.82	0.40	0.79	0.32	0.54
Orissa	0.36	0.58	0.48	0.44	0.20	0.29	0.43	0.82	0.34	0.68	0.30	0.51
Punjab	0.54	0.38	0.76	0.62	0.27	0.37	0.36	0.75	0.50	0.92	0.41	0.63
Rajasthan	0.40	0.54	0.39	0.41	0.19	0.38	0.38	0.78	0.28	0.64	0.28	0.51
TN	0.39	0.77	0.85	0.64	0.22	0.44	0.70	0.94	0.65	0.88	0.50	0.66
UP	0.25	0.46	0.25	0.27	0.16	0.32	0.35	0.81	0.16	0.59	0.22	0.47
Uttaranchal	0.65	0.74	0.59	0.63	0.25	0.42	0.68	0.84	0.46	0.75	0.42	0.57
W. Bengal	0.38	0.62	0.40	0.41	0.13	0.43	0.37	0.87	0.22	0.63	0.20	0.53

Source: Author's estimations

The analysis was carried out for 500 districts in the big states of India, leaving out states in North East (Except Assam), smaller states like Goa and Union Territories. The states in North East and Union Territories (UT) have different types of needs that cannot be compared with other bigger districts and hence their omission from this analysis is not going to affect the relative analysis here.

If the ranks of the 500 districts are analyzed for the various indices, the inter-district variations within each state become even starker. The states of Bihar, UP and Jharkhand account for more than 80 per cent of the districts belonging to the bottom 100 in terms of the overall input index. Similarly, in the outcome index rankings, the top 50 districts are from Kerala (13 districts), TN (12), HP (7), Karnataka (8), Maharashtra (4) and AP and Punjab (3 each). The lowest ranking districts are mainly from states like Bihar and Jharkhand. Needless to say, there are wide inter-district variations not only across the country, but even within states. See table 3. It is also clear that the districts which are better off in terms of inputs are also the ones with better output and outcome indicators.

	Total No. of Districts	INPUT INDEX		OUTCOME INDEX		EQUITY INDEX		EDI INDEX	
		Top 100 districts	Bottom 100 districts	Top 100 districts	Bottom 100 districts	Top 100 districts	Bottom 100 districts	Top 100 districts	Bottom 100 districts
AP	23	1		7			17	3	
Assam	23	5			5	1	2		2
Bihar	37		37		35		25		37
Chhattisgarh	13				2		3		3
Gujarat	25	14			1	6		4	
Haryana	17	1		2		2	1	3	
HP	12	12		10		10		12	
Jharkhand	20		17		17		11		18
Karnataka	27	13		20		7		20	
Kerala	14	14		14		14		14	
Maharashtra	34	13		9	2	18	1	12	1
MP	45		8	5		4	2	2	1
Orissa	30				5	6	6		2
Punjab	17	10		9			8	8	
Rajasthan	32	3	2		8	2	2		7
TN	29	1		23		17		19	
UP	70	1	29		22	1	20		26
Uttaranchal	13	11		1		7		2	
W. Bengal	19	1	7		3	5	2	1	3

Table 3. Distribution of the Top and Bottom 100 Districts across States on Various Education Development-related Indices

**Socio-economically disadvantaged districts and EDIs**

To understand the relationship between social and economic disadvantage and educational development, an analysis of the EDIs (also other related sub-components, especially the Input Index) of districts with significantly higher proportion of Scheduled Caste (SC), Scheduled Tribe (ST), Muslim and below poverty line (BPL) population was undertaken.

Districts with sizable SC population are highly dispersed across EDI and Input Index quartiles and percentiles. In the case of districts with sizable ST population[11], the Input Index distribution shows an equitable distribution, indicating that these districts are not deprived specifically of inputs (access, infrastructure and teachers). However, in the Outcome Index and EDI quartile distribution, more than 80 % of these ST districts belong to the lowest 2 quartiles, indicating that while inadequate infrastructure (input) is not a serious problem in these districts, translating these inputs into outcomes has remained a challenge. Similarly, more than 2/3rds of the districts with high Muslim concentration are in the lowest 2 quartiles of the Input Index, and more than 77% of them are in the lowest 2 quartiles of Outcome Index and EDIs. See Graph 1 below.

Graph 1
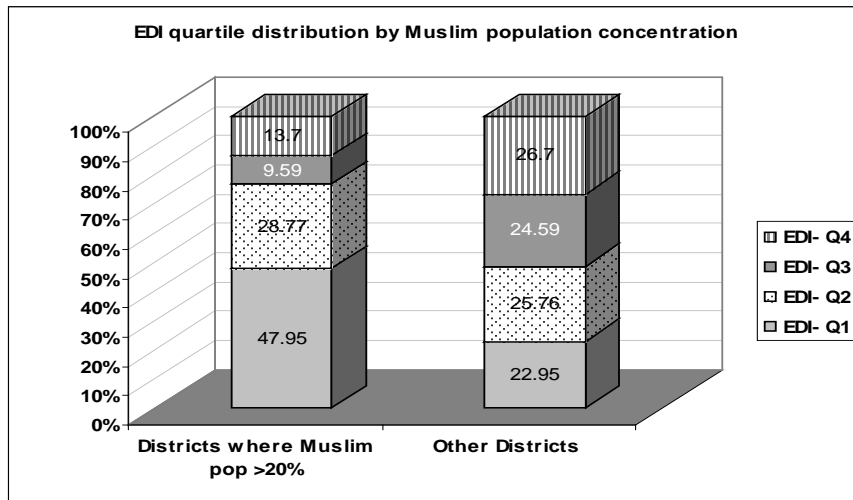
All the districts with more than 50,000 out-of-school children fall in the lower 2 quartiles of EDI, and more importantly, 75% of these districts are among the 100 districts of the country with the lowest EDIs. The same pattern is observed in an analysis of the status of these districts for the Input Index. Interestingly, more than 75% of the districts with more than 50,000 children out-of-school are the districts with more than 25% of the population living below poverty line (BPL).

Similar analysis of EDIs with high proportion of population below poverty line (BPL) was also undertaken. Around 70% of the districts with more than 25% of BPL population fall under the lowest two quartiles of input, outcome and overall EDIs. See Graph 2 below. More than half of the districts with Muslim population of more than 20% are also the districts with more than 25% population below the poverty line.

Graph 2
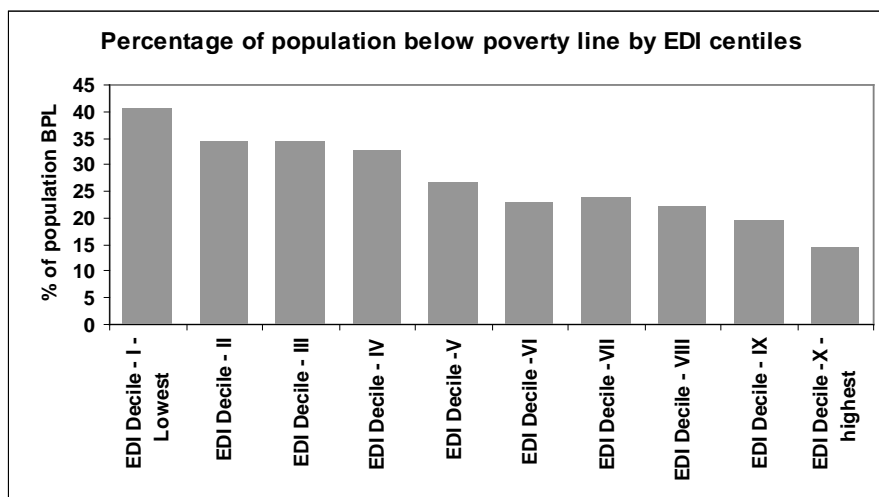
This analysis indicates that there is a significant correlation between social disadvantage, economic deprivation and educational deficiency. This corroborates the

commonly held viewpoint that various kinds of inequalities interact with and reinforce each other. Multi-dimensional deprivation operates to confine some geographical pockets and social groups in 'inequality traps'. The cause for worry is that these disadvantaged districts and blocks within a district also have relatively poorer school infrastructure.

Section 4

State and District level financial allocations under SSA in the early years: Did investments reflect need?

EDI and PCA

While the construction of EDI is useful in understanding the relative development of education provision and outcomes spatially, of various states and districts, and benchmarking them, it becomes meaningful when used as evidence for targeting funds and facilitating better implementation strategies. It would be appropriate that districts with a large infrastructure gap, greater shortage of teachers, high proportion of children not attending schools, high dropout rates or high gender gaps in enrolment would need proportionately higher financial resources to make up for the greater distance they need to cover for achieving universalization of elementary education. It is not our argument that all problems of educational deprivation can be addressed by higher financial investment. But higher financial allocations to districts that have clearly identified 'greater needs' would be the first step in ensuring an equitable approach to the problem of large educational disparities in our country.

Per Child Allocation (PCA) under SSA as an indicator is used here to examine whether the allocations of funds are going in an equity oriented manner, i.e. in accordance with relative need as evidenced by the indicators of educational inputs and outcomes. In an ideal situation, the PCA of educationally lagging states / districts should be higher than those of better off states / districts. The PCA of SSA funds in the year 2004-05 is analyzed vis-à-vis EDI in 2003-04 both at state and district levels to see whether the more deprived regions, which are also the more deserving ones, were allocated relatively higher funds. These allocations were made before such a disaggregated district level analysis of provisions and outcomes were made through EDIs. A similar analysis that compares SSA allocations to states and districts during 2007-08 and 2008-09 to the EDIs are presented in the next section.

EDI 2003-04 and PCA 2004-05

The analysis that we present below indicates that in the early years of SSA, financial investments seem to have had no relationship with educational disadvantage. In several parts of the country, educationally and economically better off regions were able to get higher resource allocations, while the 'worse-off' areas ended up getting a smaller share of resources. *Thus, per child allocations (PCA) in SSA were lower in a large proportion of the educationally most disadvantaged districts of the country.*

At the state level, HP, which has the highest EDIs, also received the maximum financial allocations per child. In Uttarakhand, where the PCA (2004-05) under SSA were quite high, also had the District Primary Education Program (DPEP) funds in six districts till March 2006. Thus the PCA in Uttarakhand were actually even higher than the figures included in this analysis. States like Chhattisgarh and MP, both somewhat are at the bottom in EDI rankings had also allocated more than Rs.1000 per child under SSA in the past couple of years. Interestingly, PCAs of AP, Bihar, Gujarat, Kerala and UP were below Rs.500/- – though they were all at different levels in terms of EDI rankings – Kerala at the top, AP and Gujarat in the middle and Bihar and UP at the bottom. There was really no pattern in the per-child SSA financial allocations across states.

There was also a clear disconnect between the 'real investment needs' of the districts and the actual allocations made on an annual basis under SSA in 2004-05. The correlation analysis between various EDI components and the district-wise per child allocations and expenditures for the 500 districts demonstrates this complete disconnect between needs and financial allocations / expenditures. Also see the spread of districts with no clear patterns in terms of PCA and EDI in graph 1.

Table 4 Correlation Matrix									
Indices of:→ ↓	Access	Infrastructure	Teacher	**INPUT**	OUT-COME	EQUITY	EDI	PCA	PCE
Infrastructure	0.3336	1							
Teacher	0.4202	0.2943	1						
Outcome	0.4069	**0.5784**	0.4027	**0.6302**	1				
Equity	0.4135	0.4672	0.3387	**0.5454**	**0.6537**	1			
PCA	0.2096	-0.0632	0.4167	0.2239	-0.0342	0.0254	0.042	1	
PCE	0.2038	0.0135	0.4142	0.2612	-0.0045	0.0501	0.075	**0.896**	1
PCE as % of PCA	-0.021	0.1617	-0.0267	0.0661	0.0551	0.0615	0.063	-0.098	0.311

Graph 3. EDI (2003-04) and Per Child Allocations (2004-05)
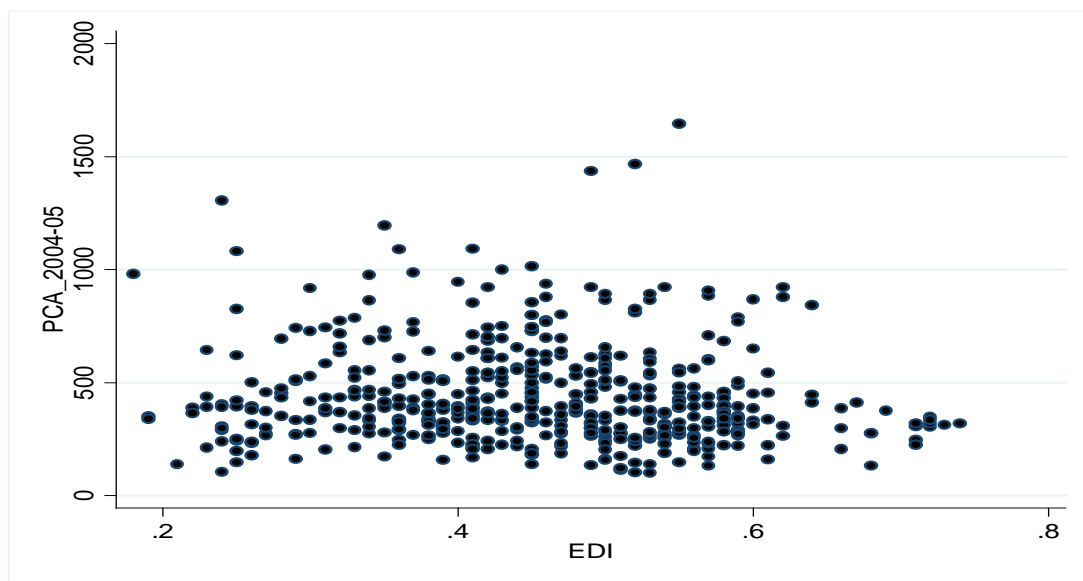
The matrix in Table 5 illustrates the overall distribution of EDIs and allocation per child by EDI quartiles and per-child allocation quartiles. Unfortunately, most of the states with a higher proportion of districts in the two lower quartiles of EDIs also have more districts in the lower quartile of per child allocations of SSA funds. 30 districts in the country that fall in the category of the worst EDIs as well as the lowest PCA allocations belonged to the state of Bihar in contrast to the 24 districts which have some of the best EDIs as well as highest PCA (half of which are in HP). *This is definitely an inequitable and undesirable situation.*

TABLE 5. Per Child Allocation quartiles and EDI quartiles: Distribution of districts across States						
PCA Quartiles →		PCA – Q1 (Lowest)	PCA – Q2	PCA – Q3	PCA – Q4 (Highest)	Total
EDI Quartiles ↓	Mean	264	374.8	504.09	832.68	491.6
	Std Dev	49.51	29.4	55.67	201.68	238.1
	Min	119	326	427	607	119
	Max	325	426	604	1483	1483
		30 dists	34 dists	34 dists	35 dists	
	EDI-1	AP (1)	Assam (1)	Assam (1)	Chattisgarh (4)	
	0.2878947	Assam (3)	Bihar (13)	Bihar (2)	Jharkhand (9)	
Mean	0.0473391	Bihar (22)	Haryana (1)	Jharkhand (4)	MP (1)	
Std Dev	0.17	Jharkhand (1)	Jharkhand (5)	MH (1)	Orissa (1)	133 dists
Min	0.35	UP (3)	Orissa (2)	MP (1)	Rajasthan (5)	
Max			UP (8)	Orissa (3)	UP (15)	
			W.Bengal (4)	Rajasthan (4)		
				UP (17)		
				W. Bengal (1)		
		25 dists	33 dists	36 dists	37 dists	
		AP (4)	AP (3)	Assam (1)	Assam (1)	
	EDI-2	Assam (5)	Assam (7)	Gujarat (1)	Chattisgarh (8)	
	0.4017557	Gujarat (5)	Haryana (2)	Haryana (1)	Haryana (1)	
Mean	0.027018	Haryana (1)	Jharkhand (1)	MP (3)	MP (9)	131dists
Std Dev	0.36	Karnataka (2)	MP (2)	Orissa (4)	Orissa (9)	
Min	0.44	MH (1)	Punjab (2)	Punjab (1)	Rajasthan (3)	
Max		Punjab (1)	Rajasthan (6)	Rajasthan (5)	UP (4)	
		Rajasthan (5)	UP (7)	UP (13)	Uttaranchal (1)	
		UP (1)	W.Bengal (3)	Uttaranchal (1)	W. Bengal (1)	
				W. Bengal (6)		
		32 dsts	23 dists	28 dists	29 dists	
		AP (6)	AP (3)	Assam (2)	Chattisgarh (1)	
		Assam (1)	Assam (1)	Haryana (5)	Haryana (1)	
		Gujarat (10)	Gujarat (1)	Karnataka (1)	MP (14)	
	EDI-3	Haryana (1)	Haryana (1)	MH (2)	Orissa (5)	112 dists
	0.4799107	Karnataka (2)	karnataka (1)	MP (7)	Rajasthan (1)	
Mean	0.0211599	MH (5), MP (2)	MH (7)	Orissa (6)	TN (1)	
Std Dev	0.45	Punjab (2)	MP (1)	Punjab (1)	UP (1)	
Min	0.51	UP (1)	Punjab (1)	Uttaranchal (2)	Uttaranchal (5)	
Max		Uttaranchal (1)	Rajasthan (3)	W. Bengal (2)		
		W. Bengal (1)	TN (4)			
		38 dists	36 dists	26 dists	24 dists	
		AP (1)	AP (4)	AP (1)	HP (12)	
	EDI-4	Gujarat (8)	Haryana (1)	Haryana (1)	Karnataka (2)	
	0.5729032	Haryana (1)	Karnataka (8)	Karnataka (5)	MH (1)	
	0.0453312	Karnataka (6)	Kerala (5)	Kerala (1)	MP (2)	124 dists
Mean	0.52	Kerala (8)	MH (8)	MH (4)	TN (4)	
Std Dev	0.77	MH (5)	Punjab (4)	MP (3)	Uttaranchal (3)	
Min		Punjab (3)	TN (6)	Punjab (2)		
Max		TN (6)		TN (8)		
				W.Bengal (1)		
	Total	125	126	124	125	500

Table 6. Status and position of states in EDI and SSA Allocations and expenditures per child.													
	Status									Rank			
		Per child allocation (PCA)			per child expenditure (PCE)			percent of allocation spent			EDI – Rank	PCA rank	PCE rank	percent spend. – rank
	EDI	State average	Min. in a district	Max. in a district	State average	Min. in a district	Max. in a district	State average	Min. in a district	Max. in a district				
AP	0.56	495	162	542	285	98	265	57.53	39.63	89.7	8	16	16	11
Assam	0.45	570	368	1606	402	238	861	70.56	53.62	90.92	12	14	9	6
Bihar	0.07	560	161	1067	221	79	331	39.56	21.78	60.79	19	15	19	19
Chhatisgarh	0.30	1035	642	1221	771	422	1044	74.47	65.83	87.00	16	3	1	4
Gujarat	0.54	434	53	2123	281	23	1209	64.83	44.01	79.98	9	19	17	10
Haryana	0.47	656	339	992	331	108	508	50.46	31.87	63.90	11	11	13	14
HP	0.82	1106	763	5217	767	528	3179	69.36	58.04	75.10	1	1	2	7
Jharkhand	0.15	845	160	1196	553	152	810	65.46	53.64	94.70	18	6	6	8
Karnataka	0.66	590	190	908	455	131	750	77.10	66.2	92.70	3	13	8	2
Kerala	0.79	448	237	452	249	127	330	55.64	48.68	74.98	2	18	18	12
Maharashtra	0.61	731	214	861	290	23	422	39.69	10.84	57.83	7	9	14	18
MP	0.48	1055	292	1225	565	148	736	53.54	39.4	73.34	10	2	5	13
Orissa	0.44	869	142	2883	361	75	1392	41.52	28.73	65.22	13	5	12	17
Punjab	0.62	597	261	643	287	112	340	48.10	33.87	65.56	6	12	15	16
Rajasthan	0.41	762	380	1126	495	236	648	64.93	57.51	78.49	14	8	7	9
TN	0.64	716	140	1235	610	115	1069	85.10	78.85	91.39	4	10	4	1
UP	0.27	478	174	987	367	113	749	76.74	50.72	99.38	17	17	11	3
Uttaranchal	0.63	903	122	1792	660	97	1379	73.04	50.1	96.86	5	4	3	5
W.Bengal	0.41	801	291	1008	398	159	549	49.66	25.52	74.98	15	7	10	15

A more important indicator of "real" investment is per child expenditure (PCE), since allocations do not reflect the funds actually spent. Since the utilization of funds is often lower in states / districts that are educationally disadvantaged, this *disconnect between need and allocation becomes further distorted for some states and districts when actual expenditures are taken into account.* For example, three states with low EDIs viz. Bihar (0.07), Orissa (0.44) and West Bengal (0.41) were able to utilize only 39.56%, 41.5% and 49.7% of the total allocations for SSA. Table 6 illustrates the per-child allocation, expenditure and spending efficiency for states as well as for the best and worst districts within states. The percentage of expenditure of the 50 districts with the lowest EDIs averaged at 54% while that of the 100 districts with the best EDIs averaged 67%.

The disparity between the need allocation of funds and actual expenditure comes out even more starkly when inter-district comparisons are made within a state. Some inter-district comparisons of SSA allocations in the early year (2004-05) are included in Appendix 2.

Why SSA financial allocations were not strongly linked to educational disadvantage in the early years?

Based on the analysis of SSA's normative framework and financial principles that guide the planning and budgeting process in the states and districts, and a very detailed study of the annual work plans of a large number of states and districts over the first few years, it became quite clear that this disconnect between actual needs of districts and the financial allocations under SSA were mainly on account of two reasons:

(a) The normative framework of planning in SSA and the financial guidelines did not actively encourage an equity–oriented approach. The Program supported a uniform budgeting approach that was not able to specifically provide for differentiated allocations for different situations. Almost 67% of the total Annual Work Plan and Budget (AWP&B) allocations of SSA are linked to the size of the district i.e. the number of schools and teachers in a district, and therefore not linked to any specific situation of a particular district.

(b) Several states and districts did not undertake evidence and need based planning processes that reflect real requirements of each district. Thus annual work plans and budgets were usually a summation of the costs allowed under each component of SSA without an in-depth and real analysis of the needs of each district.

Another pattern that emerges across the country is that the states and districts that are administratively weak and not geared to the need of a result-oriented, time-bound implementation of the multi-dimensional SSA Program end up implementing mainly, the routine activities of distribution of school level grants, civil works, textbook distribution etc. Those activities that could actually be more beneficial for the worse-off districts and social groups like, implementation of strategies for enrolment of 'out-of-school' children (OOSC), special initiatives for SC/ST and minority children take a back seat since they require more conceptualization, greater commitment and better planning and implementation capacity. For example, the 'Innovation' component that provides

united funds for context-specific interventions for disadvantaged groups is greatly underutilized in most parts of the country. But the level of utilization was lower in states and districts that are educationally the most disadvantaged. While allocations and expenditures across districts do not have any relationship with the educational ness of the districts, the allocations to the blocks within a district also often do not follow any need-based criteria. Sub-district allocations are not being made based on clearly identified criteria used to identify the more disadvantaged regions/ pockets[12]. Targets often get equally distributed across blocks and legislature assembly constituencies.

Section 5

Recent changes in SSA: Have they helped improve targeting of resources?

Following the results of the above analysis, the issue of developing criteria that could help adjusts total fund allocations for SSA to the states and districts according to some indicators of educational status received a lot of attention within the program. The MHRD had undertaken a detailed analysis of key educational indicators at State and district level. Districts were categorized as 'Special Focus Districts' (SFDs) on the basis of certain defined criteria during the Annual Work Plan and Budget review since 2006-07. SFDs were districts that were identified as requiring special attention - mainly in the form of additional funds. The Annual Work Plan and Budget (AWP&B) review process also became rigorous with the SFD plans getting utmost attention and priority. In the first year, viz. 2006-07, these districts were identified based on several criteria, some of which were not related to educational deprivation or deficit. These included: (a) Districts with a high proportion of Scheduled Caste or Scheduled Tribe population, (b) Districts with a concentration of minority (Muslim) population, (c) Districts with more than 50,000 'out of school' children, (d) 105 districts that had been declared as SFDs by the Ministry of HRD for a variety of reasons. Totally, 302 districts in the country, that is, almost half the total number of districts in the country were accorded a special status. The selection of districts was not based mainly on educational indicators.

The analysis presented in Section 4 above indicates that almost 75% of these districts, excluding the districts with sizable SC population (which are widely dispersed across the 4 EDI quartiles), figure in the 2 lowest EDI quartiles. Thus a fairly large number of these 302 districts did have low educational indicators. But, clearly, this was not the best way of identifying districts that required greater attention and funds under SSA. Moreover, the large number of districts selected as SFDs limited the scope for any differentiated strategies or preferential allocation of funds. The only exception made during the process of appraisal of annual budget proposals of states and districts was that these districts were allowed funds for school/classroom construction beyond the limit of 33% of the total annual budget of the district. Some of these districts that had high infrastructure needs did get slightly higher allocations for the construction component. Thus, a small beginning was made in 2006-07 to use some criteria to identify districts that could be earmarked for better resource allocations.

In the following years, viz. 2007-08 and 2008-09, the criteria for identification of districts and the programmatic response (mainly in terms of providing higher resource allocations) were refined. In 2008-09, the following criteria were used to identify 3 categories of SFDs:

CATEGORY – A: Districts that are deficient in school infrastructure (i.e. districts having a requirement of more than 3,000 additional classrooms and those having a Primary to Upper Primary School ratio of more than 3:1)).

CATEGORY – B: Districts with large population of disadvantaged social groups and districts with some kind of conflict or those located in border areas.

CATEGORY – C: Districts with more than 30,000 'out of school' children and districts having a gender gap in enrolment of more than 10 % at primary and also more than 20 % at upper primary level.

For districts in Category A, the limit for allocations for school construction was raised to 50 % of the total budget for the district and additional upper primary schools were sanctioned as per need. For Category B, the general advice was that these districts should have higher allocations than others. This was ensured by providing higher allocations under components like 'Innovative Activities' and 'Evaluation, Monitoring and Supervision' which are not tied to specific norms. This was done by taking a more 'lenient approach' during appraisal of plans of SFD districts. For non-SFD districts, the allocations approved were lower than the maximum allowed amounts under these categories, thus providing for some preferential allocations for SFD districts.

During the past two years, there has been a strong thrust on completing the resources of 'universal physical access' (opening of new primary schools and construction of school buildings as per need) in a time-bound manner. The approach of the 2 major states with poor educational indicators – Bihar and West Bengal – also changed, especially with respect to infrastructure and teacher related indicators. Till 2005-06, these 2 states were not proposing any new schools or recruitment of additional teachers. Beginning 2006-07, Bihar proposed for a large number of new schools and additional teachers and West Bengal also proposed a significant number of new teacher positions. Thus, through this process of identifying SFDs, the focus shifted from states to districts and some additional allocations for setting up new schools and construction of school buildings and additional classrooms are now being made to these SFDs.

The revised Framework for Implementation of *Sarva Shiksha Abhiyan* (SSA) also has incorporated the use of EDI to track progress of states towards Universal Elementary Education (UEE). It further says "the EDI ranking will encourage the States to improve their performance and have closer look at both the inputs and the outputs of the parameters that affect elementary education to a larger extent. It is expected that EDI will also enable more effective targeting of SSA to the most needy regions". (MHRD, 2008)

Is there any improvement in PCAs in 2007-08 and 2008-09 to reflect the EDIs?

The improved attention on districts, that too on the basis of criteria such as SFDs were expected to improve allocations to these districts to reflect their needs vis-à-vis other better off districts. What is the impact of such attention on SFDs in terms of planning and allocations? In order to analyze this, the PCA under SSA for 2007-08 and 2008-09 are compared to PCA for the year 2005-06. We used the same 2003-04 EDIs since we were not comparing the improvements in PCA vis-à-vis improvements every year in EDIs, but with respect to the PCA of 2004-05 in the context of EDI 2003-04.

The analysis shows that overall funds for SSA have increased from Rs. 11030 crores[13] in 2004-05 to Rs. 21383 crores in 2007-08, and 20153 in 2008-09. More importantly, the Per Child Allocations (PCA) have increased, and on an average the PCA (for the 500 districts from the major states studied here) has increased by 194% from 2004-05 to 2007-08. This definitely means that all districts have more funds now to implement SSA. However, are these funds distributed equitably so that the worse off districts receive more funds than the better off districts?

In all the states, average PCA has increased, and so also is the case of minimum PCA in a district and the maximum in a district. The increase is the highest for those districts which are in the bottom 100 in terms of EDI ranking (an increase of 365% over the PCA of 2004-05) and the increase is least in districts that are in the top 100s in terms of EDI ranking. See graph 4.

Graph 4.
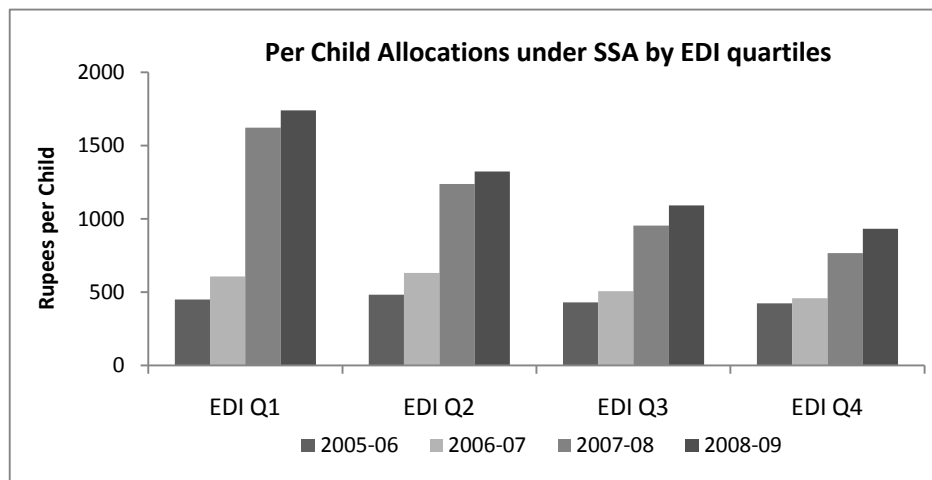
In around 10 districts, PCA has declined between 2004-05 and 2007-08. Six of these districts are from Kerala, all of which belong to the top 100 districts in terms of EDI rankings. See table 7.

Is decline in PCA a problem in these districts? Not necessarily. Because the fund requirement of these districts, especially those in Kerala is much less given that there are very little physical infrastructure to be constructed. Moreover, there is no need to plan for anticipated increase in educational services either due to large out of school

children or population increase. Highest increase in PCA was found among districts in Bihar while the lowest, in Kerala, showing clear move towards EDI groupings. The PCA of 2007-08 of 20 districts (15 of which were from Bihar, and the rest from Jharkhand and UP) that were in the bottom 100 in terms of both EDIs (EDI Quintile 1) and PCAs (PCA 2004-05 quintile 1) had tremendously improved, and in terms of PCA 2007-08 classifications, half of these districts were in the highest quintiles in terms of PCA 2007-08 quintiles and the rest 10 districts in the next 100 best districts in terms of allocations (except one district in UP). Similarly, The PCA of 2007-08 of the 20 districts that were in the top 100s both in terms of EDI and PCA shows that though there is an increase in the PCA, they are no longer the top districts in terms of allocations. Most of the districts in this category are hill districts in HP and Uttarakhand, and couple of districts from TN and Karnataka.

Table 7: Comparison of PCA between 2004-05 and 2007-08								
		EDI index		Per child allocation (PCA): 2004-05			Per child allocation (PCA): 2007-08		
	EDI index	Worst	Best	State average	Min. in a district	Max. in a district	State average	Min. in a district	Max. in a district
AP	0.56	0.34	0.57	265	101	394	998	492	1573
Assam	0.45	0.28	0.51	393	157	1091	1632	793	5430
Bihar	0.07	0.17	0.32	300	137	457	1781	1026	2471
Chhattisgarh	0.3	0.18	0.45	721	525	981	1955	1063	3528
Gujarat	0.54	0.37	0.55	223	100	608	526	293	847
Haryana	0.47	0.34	0.55	446	250	879	747	423	1119
HP	0.82	0.54	0.77	1169	650	4045	1733	870	6076
Jharkhand	0.15	0.21	0.39	532	105	1306	2155	978	4990
Karnataka	0.66	0.43	0.68	367	159	768	951	453	1750
Kerala	0.79	0.58	0.68	318	226	413	338	136	513
Maharashtra	0.61	0.32	0.62	379	157	809	664	242	1093
MP	0.48	0.32	0.54	590	204	1016	1148	543	1849
Orissa	0.44	0.3	0.51	640	434	1195	1626	911	3224
Punjab	0.62	0.41	0.63	329	181	554	467	316	662
Rajasthan	0.41	0.28	0.51	403	205	978	1586	819	3518
TN	0.64	0.5	0.66	394	132	907	707	143	1589
UP	0.27	0.22	0.47	417	167	1000	969	334	2147
Uttaranchal	0.63	0.42	0.57	733	122	1468	1685	720	3095
W. Bengal	0.41	0.2	0.53	446	277	587	951	296	1498

Overall, now the allocations seem to follow the EDI distributions, with worse off districts receiving more funds compared to better off districts. See graph 3 for a distribution of districts by EDIs and PCA for 2007-08. The negatively sloping trend is an indication of allocations becoming more and more targeted.

We also tried to see whether the pattern is similar across states. A correlation analysis of all the sub-dimensional indices along with PCAs for 2004-05 and 2007-08 was carried out. The results reveal much to what is really happening in planning for SSA.

Graph 3
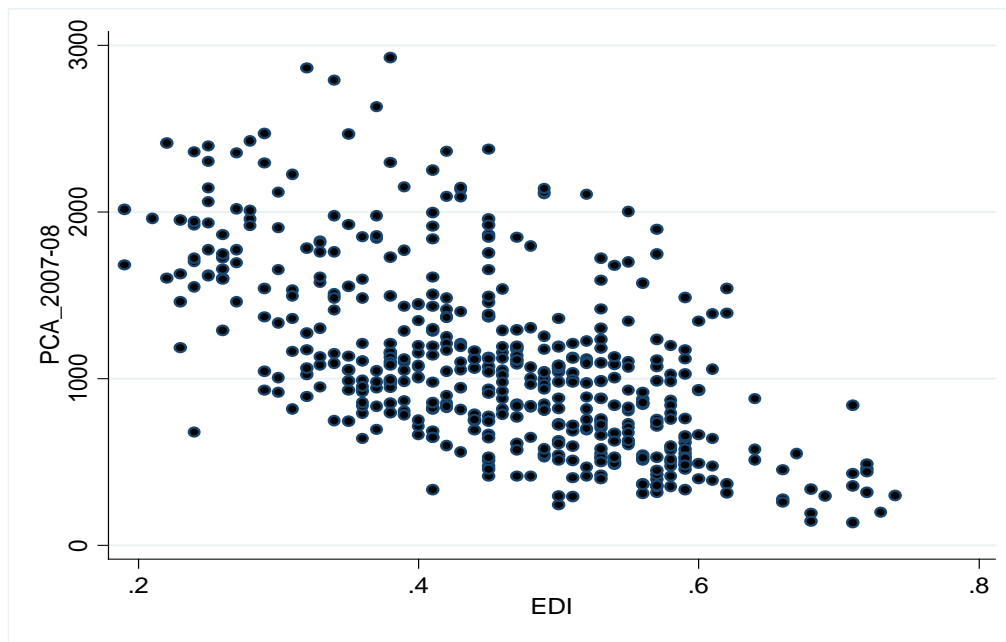
- Correlations between PCA and EDI have improved in most of the states. The negative correlation indicates that worse off districts are getting better allocations.

- Chattisgarh's EDI – PCA (2007-08) correlation is as high as -0.82. Gujarat and Jharkhand also seems to be allocating more funds per child in their educationally disadvantaged districts, and they seem to be driven more by equity oriented allocations (gender and social classification of districts)

- At least in half of the states, the fund flow per child seems to be mostly explained by the equity index. It will be interesting to see the role of specific gender related interventions like National Program for Education of Girls at Elementary Level (NPEGEL) and Kasturba Gandhi Balika Vidyalaya (KGBV – residential schools for girls from marginalized and economically vulnerable groups) in such districts.

- In around six most laggard states and districts within them, funds follow an overall pattern of input related indices. These are states and districts which are still struggling to complete the agenda of at least ensuring the enabling conditions for learning in place.

- In Bihar, teacher related index is more correlated with PCA rather than any other index. This could be attributed to the teacher appointment provisions in the state under SSA in the most poorly provided districts.

	Access Index		Infrastructure index		Teacher Index		Input Index		Equity Index		Outcome Index		Overall EDI	
	PCA-2004-05	PCA-2007-08	PCA-2004-05	PCA-2007-08	PCA-2004-05	PCA-2007-08	PCA-2004-05	PCA-2007-08	PCA-2004-05	PCA-2007-08	PCA-2004-05	PCA-2007-08	PCA-2004-05	PCA-2007-08
AP	0.18	-0.46*	0.05	-0.46*	-0.09	0.31	0.03	-0.49*	0.42*	-0.54**	0.57**	0.07	0.49*	-0.27
Assam	0.54**	0.39	-0.27	-0.21	0.77**	0.67**	0.07	0.09	0.25	0.19	0.08	-0.01	0.14	0.06
Bihar	0.14	0.18	-0.36*	-0.18	-0.18	-0.43**	-0.11	-0.04	0.09	-0.42**	-0.15	-0.25	-0.11	-0.35*
Chhattisgarh	0.004	0.25	-0.42	-0.52	0.72**	0.71**	-0.19	-0.25	-0.49	-0.76**	-0.59*	-0.82**	-0.56*	-0.81**
Gujarat	-0.23	-0.46*	0.43*	-0.19	0.62**	0.43*	-0.09	-0.42*	-0.21	-0.53**	-0.74**	-0.47*	-0.59**	-0.61**
Haryana	-0.42	-0.59*	0.04	-0.11	-0.10	-0.41	-0.48	-0.61**	0.35	-0.00	0.30	-0.13	0.18	-0.23
HP	-0.05	-0.03	0.42	0.45	0.98**	0.98**	0.75**	0.78**	-0.21	-0.30	-0.13	-0.19	0.44	0.39
Jharkhand	0.04	-0.43	-0.10	-0.19	0.18	0.11	0.08	-0.10	-0.35	-0.62**	-0.32	-0.51*	-0.33	-0.54*
Karnataka	-0.31	-0.21	-0.13	-0.28	0.46*	0.17	-0.37	-0.33	0.20	-0.20	0.21	-0.18	0.05	-0.31
Kerala	-0.35	0.07	-0.09	-0.08	0.49	-0.08	-0.24	0.05	-0.45	0.06	-0.45	-0.28	-0.43	-0.10
Maharashtra	-0.49**	-0.43**	-0.07	-0.19	0.14	-0.16	-0.35*	-0.49**	-0.34	-0.50**	0.19	-0.14	-0.02	-0.37*
MP	-0.05	0.08	-0.03	-0.09	-0.12	-0.13	-0.12	-0.20	-0.41**	-0.53**	-0.21	-0.28*	-0.31*	-0.43**
Orissa	-0.32	-0.31	-0.13	-0.18	0.59*	0.41	-0.31	-0.43*	-0.11	-0.45*	-0.05	-0.39*	-0.13	-0.47**
Punjab	0.03	-0.14	0.29	-0.06	-0.23	-0.22	0.22	-0.03	-0.18	0.01	-0.01	-0.05	0.05	-0.06
Rajasthan	-0.14	-0.25	-0.60**	-0.41*	0.40*	0.45*	-0.51**	-0.30	-0.64**	-0.63**	-0.49**	-0.29	-0.59**	-0.40*
TN	-0.31	-0.52**	-0.21	-0.46*	-0.06	-0.40*	-0.38	-0.61**	-0.43*	-0.72**	-0.07	-0.00	-0.39*	-0.58**
UP	-0.17	-0.24	0.12	0.03	-0.09	-0.19	0.09	-0.04	-0.18	-0.33*	-0.19	-0.30*	-0.16	-0.35*
Uttarakhand	-0.42	-0.55	-0.54	-0.71**	0.59*	0.41	-0.16	-0.39	0.52	0.39	-0.03	0.31	0.02	0.24
West Bengal	-0.01	0.29	0.22	-0.50*	0.60*	-0.12	0.17	-0.52*	0.47*	-0.42	0.30	-0.29	0.34	-0.45
Overall	-0.16	-0.31	-0.09	-0.50**	0.42**	0.17**	-0.09	-0.46**	0.00	-0.49**	0.01	-0.46**	-0.02	-0.51**

TABLE 8. Correlation of Sub-dimensional indices with Per Child Allocations

* Significance at 0.05 level; ** significance at 0.01 level

Another reason for the somewhat changed pattern of allocations in the past 2 years has been the strong thrust on completing the requirements of 'universal physical access'. This has resulted in higher allocations for states and districts that had bigger deficits of school facilities. The other factor that has contributed to improving the EDI-PCA relationship has been the change in the approach of 2 major states, with poor educational indicators (viz. Bihar and West Bengal), especially. This helped to improve PCAs for about 60 districts that earlier had the lowest PCAs in the country while having some of the lowest EDIs in the country.

However, the process of criteria based resource allocations is far from perfect and could do with several improvements. Some suggestions are highlighted here as examples:

a. Using indicators with gross numbers like 30,000 'out of school' children or 3000 additional classrooms works in favor of bigger districts with larger population. These are not necessarily districts with the highest proportion (percentage) of 'out of school children' or 'classroom deficits'. This needs to be modified to use indicators that are able to identify districts with the highest level of disadvantage or deprivation.

b. It is useful to use one or more indices that combine some dimensions of educational status to identify the overall status of individual districts to slot them in deciles/quintiles or quartiles. Overall per child allocations (PCA) of total funds could then be linked to such indices. The EDI developed in this study is an example of such an index. In addition, other untied funds could be preferentially allocated to districts that figure in the lowest bracket of EDIs.

c. Use of size of population of social categories is often not the best indicator for identifying educational deprivation. For example, districts with sizable SC population have very widely varying educational indicators. In some states like Kerala, Tamil Nadu, Karnataka and Maharashtra, the Muslim population has high levels of literacy and children's educational status. Also, many districts with significant pockets of Muslim population, do not figure in the list of districts with 'sizable' Muslim population. Any indicator that is based on presence of population of traditionally disadvantaged social groups should be used along with some indicator that measures educational deprivation.

At present, additional allocations are being made for these disadvantaged districts based mostly for improving physical access, especially construction of school buildings and additional classrooms, irrespective of the real nature of problems in particular districts. Thus, whether a district has high gender disparity in enrolment (owing to a traditional lower value for education of girls) or a high proportion of out of school children, a relatively higher allocation is made for construction of school buildings or additional classrooms.

Section 6

Conclusion: Some suggestions for improving equity orientation of CSS

SSA is an example of a CSS that is in the process of addressing some of the issues of better targeting of resources and effort by identifying the need for flexibility in the financial norms, promoting a more disaggregated situational analysis, adding some guidelines that encourage or persuade States and UTs to undertake context-specific planning and initiating a process of making higher allocations for infrastructure development in identified special focus districts. The existence of robust, disaggregated databases on various parameters of inputs and measurable outcomes has helped in bringing these issues to the fore in SSA. Most other CSSs in India are still way behind in identifying issues of disparity reduction and addressing them.

However a lot more needs to be done. In the light of the analysis of SSA interventions and resource allocations, and the lessons emerging from the experience of using evidence based targeting, the following five broad dimensions of change would help bring about greater equity orientation in SSA. Most of the reforms outlined below for SSA would be useful for other CSSs in the social sector.

(a) An evidence-based targeting of geographical units like district, bocks and *Panchayats* and specific social groups that are lagging behind would help focus attention and resources in these areas. The analysis and use of quantitative information, for e.g., in education sector, school-wise physical infrastructure; school-wise availability of teachers; identification of areas with concentration of socially and educationally marginalized groups like SCs, STs, religious or linguistic minorities; disaggregated analysis of children not attending school; repetition and drop-out rates needs to become an integral part of the planning process. A tradition of conduct and use of research to identify the problems and possible strategies for these pockets with low educational attainments needs to be institutionalized.

(b) The use of evidence-based criteria to identify areas / social groups that need greater attention and resources would require maintenance of reliable databases for key indicators on a regular basis. The databases and criteria would have to be well publicized and available for public scrutiny. No initiative for affirmative action would be defensible if the identification of disadvantaged areas is not done in a transparent manner. The district is actually too big a unit for identification as an area that requires special attention and measures. Each State and UT would need to identify blocks, *panchayats* and villages / towns that are deserving of a differential treatment on account of low educational indicators.

(c) There needs to be a significant shift from the present system of allocating resources to states and districts that is based mainly on uniform financial norms and past expenditure trends of states. Similarly, States have to ensure that sub-district level allocation of funds and activities is based on criteria that reflect 'real need' of various blocks or pockets. *Equitable and not equal* should be the guiding principle of such allocations. A small number of districts could be identified for special

treatment, based mainly on trends in important educational indicators. Additional resources could be provided to these districts for specific strategies that are crucial for their specific situations. However, there is a need to prepare a policy framework that emphasizes equity and compels states and districts to provide greater attention and resources to the more disadvantaged pockets and social groups.

(d) The equity orientation under SSA (and other CSSs) needs to be strengthened and articulated more clearly. Affirmative action to provide greater resources and attention to the more disadvantaged areas and groups should become the cornerstone of such programs. Once a strong principle of equity has been put in place, the guidelines of SSA (and other CSSs) would need to include clear mechanisms for operationalizing the equity orientation and also establish yardsticks to be used to examine the 'equity-orientedness' of state and district annual work plan and budget proposals.

(e) Guidelines of SSA (and other CSSs) should include greater flexibility for more need-based interventions. For example, some educationally disadvantaged regions / social groups like remote tribal areas may need funding for interventions like hostels for students and quarters for teachers working in remote areas which are presently not eligible for funding under SSA. Some pockets in the country where dropout rates are high, as also the incidence of child labor, may require more intensive social mobilization and contact with parents and teachers on a regular basis. Also, the proportion of untied allocation for educationally disadvantaged areas could be increased allowing for implementation of flexible, context-specific strategies.

The understanding that deprivation is multidimensional and that inequalities of different kinds reinforce each other should lead to the development of more holistic interventions for some very deprived pockets and social groups that are not confined to the education sector alone. Education development should be seen as a part of the overall process of human development including poverty reduction, health, nutrition and social and political empowerment. The presently segmented frameworks of our CSSs would need to become more flexible and convergent to allow for such inclusive initiatives in identified severely deprived pockets.

The use of the argument that marginalized areas have a weaker administrative set-up and are therefore not equipped to utilize higher allocations as a justification for continued under-resourcing of such areas has to be strongly countered. State governments could take decisions to place senior, sensitive, result-oriented and dynamic officers in these districts and ensure much higher level of attention and supervision in these areas. Such areas could receive priority in all processes of review. More importantly, a concerted effort has to be made to build capacity for context-specific planning and sustained implementation.

The challenge of disparity reduction is daunting. Are we as a nation committed to reduction or elimination of unacceptable gaps between regions and groups? Are we willing to work towards this objective by allocating more resources that are not bound by inflexible, uniform guidelines like the CSSs of today and to take other administrative

measures that would promote better implementation of programs and more reliable and accountable functioning of public institutions in disadvantaged areas? The Central Government (because CSSs today are shaping the direction of developmental investment in the social sector) has a major responsibility to reorient the approach of the major social sector programs to address the issue of disparity reduction and espouse the cause of a strong and unequivocal equity-centered approach.

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Annex I

Details on the construction of EDI

In this paper, development and status of various dimensions of education at elementary level relates to the assessment of performance of each state/district in relative terms—that of relative performance of the district in question with respect to the best and the worst-performing district. It allows us to normalize the selected indicators where the normalized values range between 0 and 1. This method is analogous to one that is adopted in computation of human development index (see UNDP, 2004). The variable is transformed as:

$$NVij = \left\{ 1 - \left[\frac{BestXi - ObservedXij}{BestXi - WorstXi} \right] \right\} \qquad \qquad \text{...... (1)}$$

NV_{ij} – normalized index of 'i'[th] indicator of 'j'[th] districts; X_i - original value of 'i'[th] indicator;

i = 1,2 ....n

The best X_{ij} is decided subject to the concerned indicator's lower or higher value corresponding to the best situation.

Here the lower value represents lower status in relation to a higher value of the index. A simple computation of the index is made by transforming each of the indicator values as a ratio of the difference between each value and the available best value to the entire range of variation in each of these indicators (see Planning Commission, 2002). It indicates the relative position of the districts with respect to each of the selected indicators in a range of value between 0 and 1.

Another task is constructing a composite index of all defined aspects of educational development individually as well as a common index of them across districts. There are different methods that could be adopted in the construction of these composite indices, the difference being the system of weighing each individual indicator while summarizing them into a composite index. One may choose to construct either a simple-un-weighted index which is nothing but average value of the selected indicators where each indicator is equally weighed or weighted index by giving different weights to different indicators depending on their importance. The latter one involves complication in the sense that there could be varied principles behind determining the weight of each individual indicator. On one hand, one can follow ones' own (subjective) value judgment on the importance of particular indicator implying their weight. On the other hand, weights can be determined by the statistical significance of the indicators following different statistical methods.

Principal Component Analysis[14] (PCA) is one of methods commonly adopted for this purpose. The method of PCA, in fact, seeks to reduce large number of variables into few categories known as Principal Components, which explains maximum amount of variance among a set of variable[15]. In other words PCA brings out a few non-correlated linear combinations of the original variables that accounts for the most of the variation in original variables[16].

In the present context, on one hand, one can reduce whole set of selected indicators into few factors (seen as dimension) and see the relationship between the factors. While on the other hand, by running PCA, one may construct dimension index using factor-loading values of the variable as the weight of that particular variable. One of the shortcomings of the PCA is that sometimes the factor extraction (i.e. discovering of the underlying dimensions) in the PCA may not conform to the theoretical reasoning or common sense understanding while assigning the individual variables to different factors (i.e. underlying dimensions). One may overcome this

problem if one has pre-defined dimensions according theoretical reasoning or common sense understanding and carry out PCA for each pre-defined dimension to get dimension index. In the present exercise we have followed this approach where a set of dimensions (i.e. access, infrastructure, teacher, equity, and outcome related ones) are predefined and the indicators related to each dimension is brought to PCA to determine underlying sub-dimensions within the particular dimension. On the basis of this PCA, we could obtain the dimension index (DI) in the following manner.

$$DIx = \frac{\left(\sum_{i=1}^{n} Xi \left(\sum_{j=1}^{n} Lij.Ej \right) \right)}{\left(\sum_{j=1}^{n} Lij.Ej \right)}$$

...... (2)

Where X_i – 'i'[th] variable/ indicators of Dimension X; L_{ij} - Factor loading value of 'i'[th] variable on the 'j'[th] factor for the dimension X; Ej – Eigen value of 'j'[th] factor.

In the above equation dimension index is weighted average of the individual variables of the dimension. The weight of the variable in a dimension is determined by the sum of the products of factor loading of the variable multiplied by the *eigen* value of the factor[17]. In this method, all the principal components are considered in the analysis.

Appendix 2

SSA Allocations in 2004-05 and inter-district disparities

An example of two districts from West Bengal in Table below illustrates the mismatch between 'need' and allocation' across districts within a State. Uttar Dinajpur lags far behind Paschim Medinipur in each of the educational indicators, and hence a clear contender for higher allocations to help bridge disparities. However, the PCA for 2005-06 for Uttar Dinajpur under SSA were significantly lower than that for Paschim Medinipur. However, with improved need based planning, the PCA for Uttar Dinajpur went up to INR 1186 in 2007-08, and even that of Paschim Medinipur increased, but not as much as that of the lagging district.

Appendix table 2.1		
A Tale of Two Districts: *A Case from West Bengal*	Uttar Dinajpur	Paschim Medinipur
Civil Works gap / Civil Works allocation.	14.7	1.8
Percent of out-of-school children 6 to 9 years	10.1	3.5
Percent of out-of-school children 10 to 14 years	33.5	12.7
Percentage of schools with PTR > 100	23	2
Average PTR	66	40
Gender Gap in enrolment (Upper Primary)	10.7	7.0
Enrolment in Grade V/ Enrolment in Grade I	29%	85%
Dropout Rate (Primary)	36%	7%
Completion Rate (Primary.)	23.4	75.2
Per Child Allocation 2005-06 (INR)	**355**	**666**
Per Child Allocation 2007-08 (INR)	**1186**	**754**

Table 2.2 provides some more examples of inter district comparisons within specific states that illustrate the disconnect between educational laggardness, represented by the EDI, and the

investments/expenditures under SSA. For example, while Nandurbar district of Maharashtra and Nabrangapur district in Orissa are in the bottom quartile in terms of EDIs, their PCAs are well below a desirable level – somewhat close to the national average. Unfortunately, their actual spending is much lower -33 to 40 percent of the allocations. In each of these states, some better-off districts clearly received a better share of the funds in terms of the per child allocations than the worse-off districts. Further, *the better-off districts were able to spend a higher proportion of their allocations, thus increasing the gap in per child spending between the better-off and worse-off districts.* This gap was as high as Rs 460 in Karnataka (with Raichur spending only Rs.290 per child while Uttar Kannada district spending around Rs.750 per child) and around Rs. 300 in the case of Orissa (Nabarangapur spending around Rs. 150 per child while Jagatsinghapur spending three times more per child).

Appendix Table 2.2. Some examples of district-wise SSA allocations and expenditures (2004-05)				
		2003-04	2004-05 PCA and PCE	
		EDI	Per Child Allocation	Per Child Expenditure
AP	Mehboobnagar	0.34	253	182
	Chittoor	0.55	542	225
Assam	Dhubri	0.28	406	311
	Sibsagar	0.51	755	429
Karnataka	Raichur	0.44	354	291
	Uttar Kannada	0.60	908	750
Maharashtra	Nandurbar	0.32	450	190
	Sindhudurg	0.62	730	422
Orissa	Nabarangapur	0.32	502	157
	Jagatsinghapur	0.51	843	456

Endnotes

[1] The National University of Educational Planning and Administration (NUEPA) has adapted the methodology for estimating EDI evolved by the authors for their use in analyzing the status of elementary education in India on an annual basis. NUEPA estimates EDI every year since 2005-06, comparing states in India. Now majority of States are developing district and block level EDIs to benchmark education progress at disaggregated level and to make planning and budgeting more targeted.

[2] For a detailed account of the variations in Human development across the States, please see the National Human Development Report, 2001 brought out by the Planning Commission, Government of India.

[3] Authors' estimation using State budget data from RBI State Finances.

[4] For example, the per child expenditure on education in Bihar which spends a larger share of their GDP (6% of GDP on education in 2006-07; source: Selected Education Statistics, Ministry of Human Resource Development, GOI) and state budgets (25% of state budgets on education sector in 2005-06; source, MHRD) on education is only Rs.1400 per child (6-14 years) while Punjab which allocates much less of their GDP (2.4%) and stats budgets (15%) on education spends Rs.1650 per child during the same period.

[5] Estimates from State Budgets; for a detailed analysis, see Sankar (2007)

[6] CSSs are those, which are normally identifiable responsibilities of the Central Government while the responsibility for implementation of these programs is normally vested with the State Governments. A mechanism was, therefore, devised whereby schemes are formulated with monitorable targets at the central level with adequate provision of funds in the Union Budget under various ministries. The objectives, strategy and methodology of implementation are prescribed and funds are released to the states based on their requirements (Prasada Rao, J.V.R. 2003).

[7] An independent assessment commissioned by the MHRD, Government of India (GoI) and conducted by the Social and Rural research Institute (SRI-a unit of IMRB International) between July and October 2005 has estimated the number of children in the 6-14 years age group who are not attending any school/ alternative education centre to be about 13.4 million.

[8] One of the most internationally used summation indices of education development is that of UNESCO's "Education for All Development Index (EDI)", a composite of indicators reflecting four out of the six Dakar goals. UNESCO-EDI thus incorporates indicators for universal primary education (net enrolment ratio – NER), adult literacy rates (literacy rate of people 15 years and older), and gender-specific EFA index (GEI) – an arithmetic mean of gender parity index (GPI). The UNESCO EDI reflects the "goals' – as the indicators considered are more or less outcome- oriented.

[9] This 2005 draft note on district level EDIs was published as Jhingran and Sankar (2007): "Measuring Education Development and Disparities" in Rustogi (ed): Concerns, Conflicts and Cohesions: Universalization of Elementary Education in India, Institute of Human Development and Oxford University Press.

[10] It should be noted here that states like HP and Uttaranchal (along with the states in the north- eastern part of India) have very dispersed settlements and need relatively larger inputs to reach all the habitations and hence a larger input probably means "just enough".

[11] It should be noted that only those ST districts that are located in the 19 major states have been analyzed in this paper. The North- Eastern states with high ST population concentration are not included in the study. Several districts in North-Eastern India have a good educational infrastructure as well as outcomes.

A strong evidence-based planning approach was implemented under Assam SSA where several databases were put in the public domain and transparent, well publicized criteria were used to take decisions regarding selection of schools for repair and construction, identification of schools that qualified for additional teachers, gradation of schools for providing additional academic support, identification of disadvantaged areas that would be eligible for special compensatory packages, and so on. This approach helped to create entitlements or rights to certain benefits that could not be denied or shifted to other locations. In Assam during 2002-03 and 2003-04 allocations for civil works, bridge course, community mobilization, activities for promoting education of girls, special packages of contextualized activities for special focus groups-called the 'affirmative action' package were based on identification of disadvantaged blocks, panchayats, villages and schools. This resulted in much differentiated allocations across blocks within a district.

[13] One crore is equivalent to 10 million.

[14] As a matter of fact, PCA may be used for two different purposes: i) When there are large number of variables/indicators, to simplify the analysis and bring out the underlying dimension out of those indicators it useful to reduce the large number of indicators in a few without losing their importance (for instance see Yadav and Srivastava, IAMR, 2005); and ii) In a situation of constructing a composite index and when it is necessary to give weight to each indicator, the PCA helps us in weighing each indicator according to their statistical significance (e.g see Filmer and Pritchett, 1998). When there are too many indicators related to particular phenomenon, one has to reduce them to few for simplifying the analysis.

[15] In situation of large set of information related to a phenomenon like educational development and the existence of clusters of large correlation between subsets of variables informs that these correlated variables may be measuring aspects of the same underlying dimension. These underlying dimensions are known as factors (or latent variables). Here the analysis could be simplified when one can reduce the data set from a group of correlated variables into a smaller set of uncorrelated factors. In the PCA, factors are conceived based on the statistical property (i.e. variability) where the individual indicators are combined with that of similar variability.

[16] PCA decomposes the original data into a set of linear variates.

[17] This method is used in a study on educational development across Indian States by Institute of Applied Manpower Resources, New Delhi (see Yadav and Srivastava, IAMR, 2005).