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Internal Efficiency of Primary Education in Phase-I DPEP Districts

A.B.L. Srivastava
Ed.CIL, New Delhi, India

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INTERNAL EFFICIENCY OF PRIMARY EDUCATION IN PHASE-I DPEP DISTRICTS

- *A.B.L. Srivastava*
Chief Consultant (Research & Evaluation)
Ed.CIL's Technical Support Group for DPEP
B-86, Defence Colony
New Delhi : 110 024

1. INTRODUCTION

The main purpose of studying internal efficiency is to find out the extent of wastage taking place in primary education because of some children dropping out from school prematurely (that is, without completing the full cycle of primary education) or repeating grades (that is, spending more than one year in the same grade). In a system in which *all* the children admitted in grade I continue their education till the end of the primary cycle without dropping out or repeating any grade, there is absolutely no wastage. Such a system can be regarded as perfect from the point of view of internal efficiency. However, when some children either repeat grades or drop out, internal efficiency of the system is adversely affected. The measure of internal efficiency takes into account the number of pupil-years wasted due to both dropping out and grade repetition and compares the same with the ideal situation when there is no such wastage.

The study of internal efficiency also provides information on the flow of students from grade to grade for the cohort entering grade I on the basis of grade-wise promotion, repetition and drop-out rates. Also, such indicators as 'average number of

years spent by the children in primary classes' and 'input-output ratio' can be derived from the flow chart.

This paper presents the findings of the study of internal efficiency for the DPEP Phase-I districts, based on the EMIS data on enrolment and repeaters for the years 1996/97 and 1997/98. Actually the study presents the picture for the year 1996/97, since the indicators of wastage are based on the number of those dropping out or repeating grades out of the children enrolled in 1996/97. An assumption that there is no direct entry in grades other than grade I is implicit in the methodology adopted for this study. Another implicit assumption is that there are no new admissions in grade I after 30th September which is the date of reference for data collection. Unfortunately, this is not always true, as in several places, children continue to get admitted in grade I even after 30th September. but their percentage is usually small. The results have to be interpreted keeping these assumptions in mind.

2. COMPUTATION OF REPETITION AND DROP-OUT RATES

The two important indicators of wastage are *repetition rate* and *dropout rate*, which can be calculated for any grade and any year from the grade-wise data on repeaters and drop-outs. The repetition rate for grade i and year t is defined as :

$$RR(i, t) = \frac{\text{Number of repeaters in grade i in year t + 1}}{\text{Enrolment in grade i in year t}}$$

The number of children who drop out from a given grade is obtained by subtracting from the total enrolment of that grade in a given year, the number of those who got

promoted to the next grade as well as the number of those who repeated the same grade in the following year. Thus the drop-out rate for grade i in year t is :

$$DR(i, t) = \frac{E(i, t) - R(i, t+1) - P(i+1, t+1)}{E(i, t)}$$

where $E(i, t)$ = Enrolment in grade i in year t

$R(i, t+1)$ = Number of repeaters in grade i in year t + 1

$P(i+1, t+1)$ = Number of promotees in grade i + 1 in year t + 1 (i.e. the number of those promoted from grade i of year t to grade i + 1 of year t + 1)

The repetition and drop-out rates are usually expressed in the form of percentage.

In some of the districts, the drop out rates in certain classes were found to be negative, mainly due to the following reasons :

(i) *Lateral entry in grades other than grade I:* Some children take admission directly in classes II, III, IV or V. Such children have either studied at home or in an unrecognised private school before seeking entry in a government or recognised private school.

(ii) *Late admissions in grade I:* Schools continue to admit children in grade I even after 30th September. As a result, some children of grade I who were admitted after this date and hence were not enumerated in 1996-97, were included among the promotees or repeaters in the following year, 1997-98.

To obviate the difficulty in analysis of data arising from negative drop-out rates, it has been assumed that the dropout rates in all such cases are 0.005 or 0.5%.

Another point to be noted is that, in our analysis, the graduation rate or promotion rate for the last grade (IV or V as the case may be) of the primary cycle is actually the proportion of students in this grade who do not repeat. In the absence of data on the number of graduates, it has been assumed that all the students who reach the last grade eventually become graduates, with some among them after repeating the grade for one or more years. In effect, it means the drop-out rate in the last grade is zero.

3. STUDENT FLOW CHART

If the cohort of children who are admitted in grade I in any year are followed up for the next few years, it will be observed that (a) some would be getting promoted from one grade to the next till they complete the full cycle of primary education successfully without repeating any grade, (b) some would eventually complete the full cycle of primary education after repeating one or more grades and thus taking more than the minimum 4 or 5 years required for the purpose, and (c) others would be dropping out from school before completing the primary education cycle. If we start with a hypothetical cohort of 1000 grade I pupils, and if the repetition and drop-out rates of the year 1996-97 hold good, then we can draw a flow chart for this cohort. The chart would show how many from this cohort drop out or repeat grades each year and how many eventually complete the full primary cycle, either in the minimum 4/5 years or in more years than that because of repetition. The method of deriving internal efficiency indicators in this way is known as ***Reconstructed Cohort Method***. The main assumptions made in these flow charts are (1) the repetition and drop-out rates of 1996-97 hold good for the cohort and (2) no child repeats any grade for more than

3 years. Chart I shows the flow chart for Sirsa, a district of Haryana, based on the repetition and dropout rates of 1996/97.

4. Computation of Input-Output Ratio and Other Indicators of Internal Efficiency

(i) Input-Output Ratio and Coefficient of Efficiency

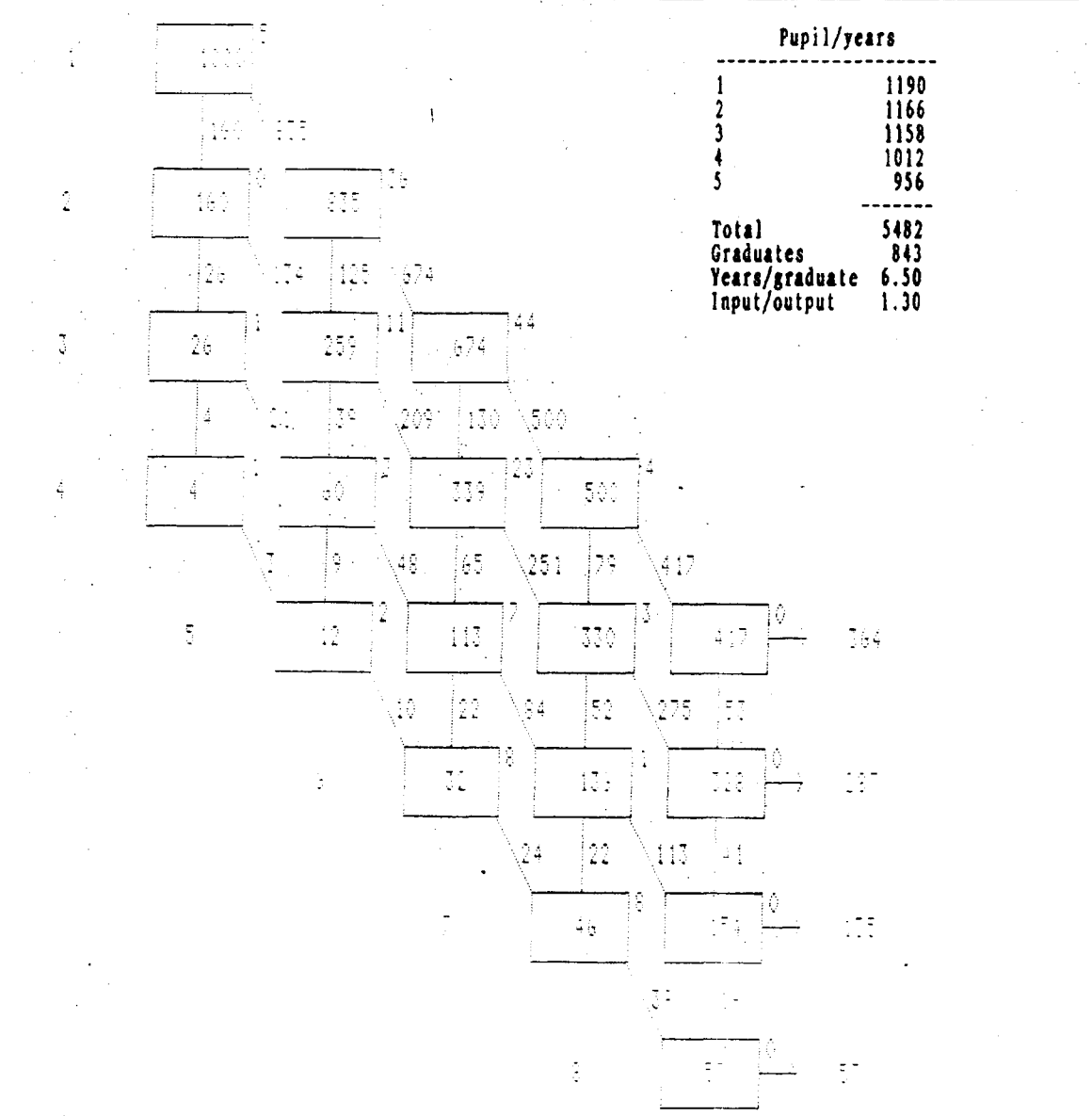
In a 5-grade cycle of primary education, if all the pupils of a cohort of 1000 complete the primary cycle in 5 years and nobody repeats any grade and nobody drops out, the number of pupil-years spent by the cohort would be 1000 X 5 = 5000, and the number of graduates produced by the system would be 1000, with no one taking more than 5 years for graduating. The ratio of the number of pupil–years to the number of graduates in this ideal system is 5000:1000 or 5:1. In the case of a system in which some pupils repeat grades or drop out prematurely, this ratio will obviously be more than 5:1. This ratio which we may call *Pupil-Years/Graduates Ratio* (or PY/G ratio) is itself an important indicator of the years wasted by a cohort in producing primary graduates.

In the case of Sirsa district, we find that the ratio of pupil-years to the number of graduates is 5482:843 or 6.50:1. If we compare this ratio with the ideal ratio, we get an idea of inefficiency of the system.

The *input-output ratio* is simply the ratio of the PY/G ratio to the ideal ratio and can be written as :

Chart 1

HYPOTHETICAL FLOW OF THE COHORT OF 1. PRIMARY EDUCATION
MALE AND FEMALE



$$\text{Input-output ratio} = \frac{\text{Total number of pupil-years}}{\text{Total number of graduates x k}}$$

where k = number of grades in the system.

The inverse of input-output ratio is known as *Coefficient of Efficiency*. The closer this coefficient is to 1, the more efficient the system is. Usually, it is expressed in the form of percentage, in which case its value will lie between 0 and 100.

(ii) Cohort Dropout Rate and Average Duration of Study

The flow chart enables us to find out how many pupils out of the cohort of 1000 reach grade 2, 3, 4 and 5, when some of them repeat grades and some drop out. The 'evolution of cohort' presented beneath the flow chart in Annex I provides information about how many drop out from each grade and how many move up the educational ladder from grade to grade out of the cohort of 1000, irrespective of the number of years taken by them to reach any given grade. In the case of Sirsa district, the cohort retention rate is 84.3% and the cohort dropout rate is 15.7%.

It is also of interest to find out the *Average Duration of Study* for the *cohort*, for the *graduates*. To determine these averages we have to compute from the figures in the flow chart, the average number of years taken by the graduates to complete the primary cycle. For the example of Sirsa, the *Average Duration of Study* (ADS) for the graduates obtained is as follows :

$$\text{ADS (graduates)} = \frac{364x5+287x6+135x7+57x8}{843} = 5.9 \text{ years}$$

(iii) Proportion of Wastage Attributable to Repetition and Dropping-Out

Since wastage occurs because of pupils repeating grades as well as pupils dropping out from school, it is of interest to see how much these two factors individually contribute to the overall wastage. For this, we have to calculate (a) the pupil-years wasted due to repetition and (b) the pupil-years wasted due to children dropping-out before completing the last grade.

In the case of Sirsa, we find that the total pupil-years wasted due to repetition are

$$(160+26+4) + (125+39+9) + \ldots + (53+41+19) = 190 + 173 + 217 + 153 + 113 = 846$$

The number of pupil-years wasted due to dropping out is calculated by adding up the number of pupil-years spent by the children in school who drop out after (or from) grade 1, grade 2, and so on. The number is

$$(5+0+1+1) \times 1 + (36+11+3+2) \times 2 + (44+23+7+8) \times 3 + (4+3+1+8) \times 4$$
$$= 7 + 104 + 246 + 64 = 421$$

Thus, out of the total 846 + 421 = 1267 wasted pupil-years, 846 or 66.8% were wasted due to repetition and the rest 421 or 33.2% were wasted due to children dropping out before grade 5.

5. COMPUTATION OF RETENTION AND DROP-OUT RATES BY THE TRADITIONAL METHOD (WITHOUT USING THE DATA ON REPEATERS)

The retention rate derived by the traditional method is simply the ratio of the enrolment in the last grade of primary level to the enrolment in grade I of the year in which most children of the cohort started their primary education. Thus, for the primary cycle of 4 years, the retention rate for the period 1993-96 is the ratio of class IV enrolment of 1996/97 to class I enrolment of 1993/94. Similarly, in the case of 5-year cycle of primary education, the retention rate for the period 1993-97 is the ratio of class V enrolment of 1997/98 to class I enrolment of 1993/94. This method is often used for estimating retention rate.

6. INTERNAL EFFICIENCY INDICATORS FOR DPEP DISTRICTS

(a) Input-Output Ratio and Coefficient of Efficiency

Table 1 gives input-out ratios for male and female pupils and their total for all the DPEP districts of Phase I, except Dhar and Raigarh in Madhya Pradesh, for the year 1996-97. These two districts were excluded because of some obvious discrepancies in their data or due to lack of data. This table gives the coefficients of efficiency (CE) also, which is just the inverse of the input-output ratio expressed as percentage.

We find that out of the 40 DPEP districts, internal efficiency is good (CE being over 80) in 18 districts; satisfactory (CE between 70 and 80) in another 13 districts; and

rather poor (CE below 70) in the remaining 9 districts. State-wise distribution of the districts according to CE, is as follows :

(i) *Good internal efficiency (CE over 80) - 18 districts*

Karnataka	- Belgaum, Kolar and Mandya
Kerala	- Kasargod, Mallapuram and Wayanad
Haryana	- Kaithal
Maharashtra	- Latur and Osmanabad
Madhya Pradesh	- Betul, Guna, Rajgarh, Ratlam, Satna and Shahdol
Tamil Nadu	- Cuddalore, Thiruvannamalai and Villupuram

(ii) *Satisfactory internal efficiency with scope for further improvement (CE between 70 and 80) - 13 districts*

Karnataka	- Raichur
Haryana	- Hisar, Jind and Sirsa
Maharashtra	- Aurangabad, Nanded and Parbhani
Madhya Pradesh	- Mandsaur, Raisen, Rajnandgaon, Shahdol and Tikamgarh
Tamil Nadu	- Dharmapuri

(iii) *Poor internal efficiency requiring definite measures for improvement (CE below 70) - 9 districts*

Assam	- Darrang, Dhubri and Morigaon
Madhya Pradesh	- Bilaspur, Guna, Panna, Rewa, Sidhi and Surguja

Of these, two districts of Assam (Dhubri and Morigaon) are very low in internal efficiency as their CE is only 48.8 and 56.8 respectively.

In terms of *input-output ratio*, we can say that in the 18 districts in which CE is over 80, this ratio is 1.25 or less, which means that the expenditure does not exceed by more than 25% of what would have been incurred in the ideal case of no wastage

resulting from grade repetition and dropping out. In the 13 districts in which CE is between 70 and 80, the input-output ratio is between 1.25 and 1.43. In these districts, the expenditure is 25 to 43 percent more because of repetition and dropping out compared to the ideal case of no wastage. And in the 9 districts in which CE is below 70, the expenditure is over 43% compared to the ideal case because of high rates of grade repetition and dropping out.

TABLE 1
INPUT-OUTPUT RATIO, COEFFICIENT OF EFFICIENCY AND COHORT DROP-OUT RATE BASED ON REPETITION RATES AND DROP-OUT RATES OF 1996-97

State / Districts	Input-Output Ratio			PY/G Ratio	Coefficient of Efficiency			Cohort Dropout Rate		
	Boys	*Girls*	*Total*		*Boys*	*Girls*	*Total*	*Boys*	*Girls*	*Total*
States with Class IV as the highest Class										
ASSAM										
Darrang	1.53	1.54	**1.54**	**6.14**	65.4	65.0	**65.1**	44.8	46.0	**45.5**
Dhubri	2.07	2.02	**2.05**	**8.20**	48.2	49.8	**48.8**	56.9	54.4	**55.7**
Morigaon	1.81	1.72	**1.76**	**7.04**	55.2	58.1	**56.8**	58.2	55.1	**56.6**
KARNATAKA										
Belgaum	1.25	1.22	**1.24**	**4.95**	81.7	79.8	**80.9**	9.2	12.6	**10.7**
Kolar	1.09	1.11	**1.10**	**4.41**	91.4	89.8	**90.6**	6.5	9.1	**7.8**
Mandya	1.08	1.08	**1.08**	**4.33**	92.3	92.4	**92.4**	1.7	1.5	**1.5**
Raichur	1.26	1.32	**1.29**	**5.15**	79.1	76.0	**77.7**	22.6	28.4	**25.2**
KERALA										
Kasargod	1.06	1.04	**1.05**	**4.20**	94.8	95.9	**95.3**	1.0	2.2	**1.7**
Mallapuram	1.15	1.12	**1.14**	**4.54**	86.7	89.2	**88.0**	15.8	13.4	**14.5**
Wayanad	1.05	1.05	**1.05**	**4.19**	95.1	95.6	**95.4**	1.5	3.1	**1.8**
States with Class V as the highest Class										
HARYANA										
Hisar	1.26	1.32	**1.28**	**6.42**	79.4	76.0	**77.8**	14.8	21.1	**17.8**
Jind	1.25	1.29	**1.27**	**6.34**	80.0	77.4	**78.9**	20.0	20.8	**20.0**
Kaithal	1.26	1.28	**1.25**	**6.24**	80.1	79.5	**80.1**	18.6	19.3	**16.9**
Sirsa	1.30	1.32	**1.30**	**6.50**	76.7	75.8	**76.9**	14.7	18.4	**15.7**
MAHARASHTRA										
Aurangabad	1.30	1.33	**1.31**	**6.57**	76.9	75.4	**76.1**	33.0	34.5	**33.7**
Latur	1.17	1.22	**1.20**	**5.98**	85.3	81.9	**83.6**	21.1	26.3	**23.7**

State / Districts	Input-Output Ratio			PY/G Ratio	Coefficient of Efficiency			Cohort Dropout Rate		
	Boys	*Girls*	*Total*		*Boys*	*Girls*	*Total*	*Boys*	*Girls*	*Total*
Nanded	1.31	1.37	**1.34**	**6.71**	76.2	72.8	**74.5**	30.2	33.7	**32.0**
Osmanabad	1.16	1.20	**1.18**	**5.91**	85.9	83.2	**84.6**	21.2	25.0	**23.0**
Parbhani	1.27	1.28	**1.27**	**6.37**	79.0	78.0	**78.5**	24.2	25.0	**24.6**
MADHYA PRADESH										
Betul	1.24	1.26	**1.24**	**6.21**	80.8	79.5	**80.6**	13.6	16.4	**14.1**
Bilaspur	1.53	1.66	**1.59**	**7.93**	65.3	60.3	**63.0**	49.5	56.5	**52.8**
Chhatarpur	1.12	1.15	**1.13**	**5.66**	89.1	87.0	**88.3**	9.0	11.4	**9.9**
Guna	1.44	1.89	**1.59**	**7.94**	69.3	53.1	**62.9**	35.1	53.6	**42.7**
Mandsaur	1.27	1.48	**1.35**	**6.77**	78.9	67.4	**73.9**	31.9	45.5	**38.0**
Panna	1.43	1.72	**1.55**	**7.74**	70.0	58.0	**64.6**	44.2	57.0	**50.1**
Raisen	1.32	1.26	**1.29**	**6.45**	75.7	79.2	**77.5**	39.1	29.9	**34.9**
Rajgarh	1.07	1.28	**1.12**	**5.59**	93.4	78.0	**89.5**	2.9	23.8	**8.4**
Rajnandgaon	1.29	1.34	**1.30**	**6.52**	77.8	74.7	**76.7**	28.5	33.4	**30.3**
Ratlam	1.12	1.16	**1.13**	**5.67**	89.6	86.4	**88.2**	13.1	18.0	**15.2**
Rewa	1.68	1.53	**1.61**	**8.05**	59.5	65.4	**62.1**	60.0	52.2	**56.6**
Satna	1.17	1.14	**1.16**	**5.78**	85.7	87.5	**86.5**	21.9	17.0	**19.7**
Sehore	1.19	1.28	**1.22**	**6.12**	83.9	78.1	**81.7**	23.5	28.7	**25.4**
Shahdol	1.28	1.31	**1.29**	**6.47**	78.1	76.2	**77.3**	38.1	39.3	**38.6**
Sidhi	1.39	1.53	**1.44**	**7.18**	71.8	65.4	**69.7**	39.6	48.0	**42.6**
Surguja	1.56	1.65	**1.60**	**8.00**	64.1	60.8	**62.5**	55.9	60.4	**58.0**
Tikamgarh	1.34	1.34	**1.35**	**6.73**	74.4	74.5	**74.3**	34.2	34.7	**34.5**
TAMIL NADU										
Cuddalore	1.19	1.18	**1.19**	**5.93**	84.0	84.5	**84.3**	10.8	9.0	**9.8**
Dharmapuri	1.28	1.27	**1.28**	**6.38**	78.3	78.5	**78.3**	25.1	25.2	**25.3**
Thiruvannamalai	1.18	1.17	**1.18**	**5.88**	85.0	85.1	**85.1**	12.2	12.1	**12.2**
Villupuram	1.23	1.26	**1.24**	**6.21**	81.5	79.5	**80.5**	12.7	17.7	**15.1**

(b) Ratio of Pupil-Years to Number of Graduates

The ratio of number of pupil-years that a cohort of 1000 spends in school to the number of graduates eventually produced out of the cohort, gives an idea of the years required to produce a primary graduate. In the ideal case, it is 5 years if the primary cycle is of 5

years duration. If it is more than 5 years, it is due to the time wasted because of repetition and dropping out. Table 1 gives the values of this ratio as *Pupil-Years/Graduates Ratio* (PY/G ratio) in one of the columns for the total pupils (boys+girls). Actually, this ratio divided by the value of the ideal PY/G ratio (that is, 4 in the case of 4-year primary cycle and 5 in the case of 5-year cycle) is the input-output ratio.

We find that among the states with 4-year cycle of primary education, in **Assam**, 6 to 8 pupil-years are required to produce a primary graduate, instead of the ideal 4 years. Of the three districts, Dhubri is the worst with PY/G ratio of 8.20. In **Karnataka**, the number of pupil-years needed to produce a primary graduate ranges between 4.33 (in Mandya) and 5.15 (in Raichur). In **Kerala**, the situation is relatively better since the PY/G ratio is only 4.2 in two districts, Kasargod and Wayanad. It is, however, a little higher (4.54) in Mallapuram.

Among the states with 5-year primary education cycle, in **Haryana**, the PY/G ratio ranges between 6.24 to 6.50, which means that 25% to 30% more time is spent for producing a primary graduate. In **Maharashtra**, the PY/G ratio lies between 5.9 to 6.6; and in **Tamil Nadu**, between 5.9 and 6.4. In **Madhya Pradesh**, the variation in the values of PY/G ratio is quite large over the districts. It is as low as 5.6 in Rajgarh and as high as 8.0 in Rewa and Surguja. Out of 17 districts, in six it is between 7.0 and 8.0; in seven, it is between 6.0 and 7.0 and in the remaining four, it is between 5.6 and 6.0.

The median value of PY/G ratio for the 10 districts with 4-year primary cycle is 4.4 years and for the 30 districts with 5-year primary cycle, it is 6.4 years.

(c) Cohort Drop-out Rate

Table 1 also gives the *drop-out rate* for the cohorts entering grade I based on the repetition and drop-out rates of 1996-97. If in any grade the drop-out rate was negative, it was assumed to be 0.5%.

Among the states with class IV as the highest class, **Assam** has the highest drop-out rate as over 45% children drop out before grade IV. In Dhubri and Morigaon, the situation is particularly bad as between 55 and 57 per cent children of grade I drop out before grade IV, whereas in Darrang 45.5% do so. In **Karnataka**, only in Raichur the drop-out rate is as high as 25.2%. In Belgaum it is 10.7%, in Kolar it is 7.8% and in Mandya, it is as low as 1.5%. In **Kerala**, only in Mallapuram the drop-out rate is somewhat high (14.5%); in the other two districts, it is below 2%. In the states where class V is the highest class, the dropout rate is the percentage of pupils of class I cohort who drop out before grade V. In **Haryana**, this drop-out rate is highest in Jind (20.0%), while in the other three districts it is between 15 and 18 percent. In **Maharashtra**, the drop-out rate is rather high in Aurangabad and Nanded (between 32 and 34 percent), but relatively low in the other three districts (between 23 and 25 percent). In **Madhya Pradesh**, as the number of districts is large, the variation in drop-out rate is also large, ranging between 8% and 58%. The districts with very high dropout rate (between 50 and 58 percent) are Bilaspur, Panna, Rewa and Surguja. In **Tamil Nadu**, only in Dharampuri, the drop-out rate is as high as 25.3%. In the remaining three districts, it is between 10 and 15 percent.

Out of the 40 districts, we find that the *cohort drop-out rate* is *below 10%* in 7 districts; *between 10 and 20 percent* in 10 districts; *between 20 and 30 percent* in 7 districts; *between 30 and 40 percent* in 7 districts; and *between 40 and 60 percent* in 9 districts.

(d) Average Duration of Study for Graduates

The *average duration of study* for the '*graduates*' or completers of primary education, is the average number of years they take to complete the highest grade of primary cycle. In **Assam**, they take 4.7 to 5.8 years instead of 4.0 years because of high repetition rates. In **Karnataka** and **Kerala**, they take 4.2 to 4.3 years instead of 4.0 years (except in Belgaum where it is 4.6 years). In the other four states where the primary cycle is of 5 years duration, they take 5.7 to 5.9 years in **Haryana**; 5.2 to 5.4 years in **Maharashtra** (where repetition rates are relatively lower) and 5.5 to 5.6 years in **Tamil Nadu**. In **Madhya Pradesh**, the variation is large. In some districts, they take only 5.1 to 5.3 years; in others, they take 5.6 to 5.8 years to complete grade 5.

(e) Proportion of Wastage Attributable to (a) Grade Repetition and (b) Dropping Out

Here, the question being addressed is this : of the two factors, 'grade repetition' and 'dropping out from school before completing the full primary cycle', which one contributes more to wastage and how much is the relative contribution of each of these. The method of calculation of these percentages is explained with an example in

Section 4. Obviously, where the repetition rates are high compared to drop-out rates, the proportion of total wastage attributable to grade repetition is higher.

In some districts, the grade repetition has contributed more to wastage and in others, the contribution of 'dropping out' was more. In 23 districts out of the forty, 'dropping out' has contributed more to total wastage compared to 'grade repetition'. These are : Morigaon in **Assam**; Raichur in **Karnataka**; Mallapuram in **Kerala**; all the 5 districts in **Maharashtra**; 14 out of 17 districts in **Madhya Pradesh**; and Dharmapuri in **Tamil Nadu**.

7. GENDER DIFFERENCES IN INTERNAL EFFICIENCY

(a) Coefficient of Efficiency

In general, the gender difference in respect of internal efficiency is small in most of the districts. In 24 districts out of the 40 covered in this study, the *coefficient of efficiency* in the case of girls is not very different from that of boys, the difference between the two being less than 3 points. In 14 districts, this coefficient for girls is less than that for boys. Of these 14 districts, ten are in Madhya Pradesh. In only two districts (Raisen and Rewa in Madhya Pradesh), the *coefficient of efficiency* for girls is substantially higher than that for boys.

(b) Cohort Drop-out Rate

Of the 40 districts, the drop-out rate of girls exceeds that of boys in 25 districts, while it is almost equal to that of boys in 5 districts (the difference between the two being less than 1 point) and less than that of boys in 10 districts. However, only in 11 out of the 40 districts, the cohort drop-out rate of girls exceeds that of boys by 5.0 or more percentage points (the percentage points by which the drop-out rates of girls exceeds that of boys are shown for each district in parenthesis):

> *Hisar (6.3) in Haryana; Raichur (5.8) in Karnataka; Latur (5.2) in Maharashtra; Villupuram (5.0) in Tamil Nadu; Bilaspur (7.0), Guna (18.5), Mandsaur (13.6), Panna (12.8), Rajgarh (20.9), Sehore (5.2) and Sidhi (8.4) in Madhya Pradesh.*

An odd case is that of Rajgarh where the drop-out rate of boys is as low as 2.9% and that of girls is 23.8%. It could be due to some error in the data of Rajgarh.

8. RETENTION AND DROP-OUT RATE DERIVED BY THE APPARENT COHORT METHOD - CHANGES OVER THE PERIOD 1993/94 - 1996/97

In the absence of data on repeaters, the retention rate is derived simply by comparing the enrolment in the successive grades in successive years. The method known as ***Apparent Cohort Method***, however, provides only approximate estimates of the drop-out rate, since the model assumes that the pupils are either promoted or they drop out. The fact that they also repeat grades, is ignored. Here we are using this method to

assess the drop-out rate for the Phase I DPEP districts in two ways, (i) by comparing the enrolment of grade I in 1993 (obtained from the Sixth All India Educational Survey) with that of the last grade of the primary cycle in the year in which the pupils of this cohort are expected to be in the last grade (this is the traditional approach); and (ii) by comparing the enrolment of grade I and other grades in 1996/97 with the enrolment in the successive grades in the following year.

Table 2 gives the dropout rates obtained by these methods for the 23 districts of six states, excluding those of Madhya Pradesh for which the relevant data was not available.

TABLE 2
DROP-OUT RATES BASED ON CLASS I COHORT OF 1993 AND GRADE-TO-GRADE PROGRESSION RATES OF 1996/97 BETWEEN CLASS I AND CLASS IV/V, USING APPARENT COHORT METHOD

State/District	Drop-out rate based on the 6th AIE Survey (1993), cohort of class I			Drop-out rate based on grade-to-grade progression rates of 1996/97			Decrease in drop-out rate			Gender differences	
										1993	1996
	Boys	*Girls*	*Total*	*Boys*	*Girls*	*Total*	*Boys*	*Girls*	*Total*	*Boys-Girls*	*Boys-Girls*
States with class IV as the highest class											
ASSAM											
Darrang	67.1	67.9	**67.4**	52.8	55.7	**54.2**	14.3	12.2	**13.2**	-0.8	-2.9
Dhubri	73.9	74.4	**74.1**	73.6	73.7	**73.7**	0.3	0.7	**0.4**	-0.5	-0.1
Morigaon	70.1	70.7	**70.4**	68.5	66.9	**67.7**	1.6	3.8	**2.7**	-0.6	1.6
Total	**70.7**	**71.2**	**70.9**	**65.8**	**66.4**	**66.1**	**4.9**	**4.8**	**4.8**	**-0.5**	**-0.6**
KARNATAKA											
Belgaum	16.4	19.7	**19.8**	12.7	16.6	**14.6**	3.7	3.1	**5.2**	-3.3	-3.9
Kolar	22.0	26.3	**24.1**	4.5	10.3	**7.4**	17.5	16	**16.7**	-4.3	-5.8
Raichur	21.1	22.9	**22.0**	25.3	35.3	**28.6**	-4.2	-12.4	**-6.6**	-1.8	-10.0
Mandya	39.4	50.6	**44.4**	-7.8	1.0	**-3.4**	47.2	49.6	**47.8**	-11.2	-8.8
Total	**24.9**	**29.8**	**27.3**	**12.3**	**17.3**	**14.7**	**12.6**	**12.5**	**12.6**	**-4.9**	**-5.0**
KERALA											
Kasargod	0.7	2.9	**1.8**	-9.9	-6.6	**-8.3**	10.6	9.5	**10.1**	-2.2	-3.2
Mallapuram	-1.3	0.5	**-0.4**	8.2	7.6	**7.9**	-9.5	-7.1	**-8.3**	-1.8	0.6

State/District	Drop-out rate based on the 6th AIE Survey (1993), cohort of class I			Drop-out rate based on grade-to-grade progression rates of 1996/97			Decrease in drop-out rate			Gender differences	
										1993	1996
	Boys	*Girls*	*Total*	*Boys*	*Girls*	*Total*	*Boys*	*Girls*	*Total*	*Boys-Girls*	*Boys-Girls*
Wayanad	12	10.2	**11.2**	-7.7	-8.6	**-8.2**	19.7	18.8	**19.4**	1.8	0.9
Total	**0.8**	**2.2**	1.5	2.9	3.0	2.9	**-2.1**	**-0.8**	**-1.4**	**-1.4**	**0.1**
States with class V as the highest class											
HARYANA											
Kaithal	23.3	26.5	**24.7**	21.7	26.0	**23.5**	1.6	0.5	**1.2**	-3.2	-4.3
Hisar	23.8	27.1	**25.0**	8.9	18.6	**13.5**	14.9	8.5	**11.5**	-3.3	-9.8
Jind	22.2	26.5	**24.1**	25.4	27.1	**26.1**	-3.2	-0.6	**-2.0**	-4.3	-1.7
Sirsa	31.6	34.5	**32.9**	12.5	23.0	**17.5**	19.1	11.5	**15.4**	-2.9	-10.6
Total	**24.8**	**28.5**	**26.4**	**16.1**	**22.9**	**19.2**	**8.7**	**5.6**	**7.2**	**-3.7**	**-6.8**
MAHARASHTRA											
Aurangabad	29.4	32.4	**30.8**	36.1	37.8	**36.9**	-6.7	-5.4	**-6.1**	-3.0	-1.8
Nanded	43.3	46.3	**44.8**	32.6	35.8	**34.2**	10.7	10.5	**10.6**	-3.0	-3.2
Parbhani	30.5	37.7	**34.0**	27.7	29.4	**28.5**	2.8	8.3	**5.5**	-7.2	-1.7
Latur	27.3	31.3	**29.3**	23.0	27.8	**25.4**	4.3	3.5	**3.9**	-4.0	-4.8
Osmanabad	30.4	33.0	**31.6**	23.0	26.7	**24.8**	7.4	6.3	**6.8**	-2.6	-3.6
Total	**33.1**	**37.2**	**35.1**	**29.6**	**32.4**	**31**	**3.5**	**4.8**	**4.1**	**-4.1**	**-2.8**
TAMIL NADU											
Cuddalore	14.3	13.5	**13.9**	13.7	12.4	**13.1**	0.6	**1.1**	**0.8**	0.8	1.3
Dharmapuri	34.3	35.6	**34.9**	26.7	27.3	**27.0**	7.6	8.3	**7.9**	-1.3	-0.6
Thiruvannamalai	20.9	21.2	**21.1**	13.2	14.4	**13.8**	7.7	6.8	**7.3**	-0.3	-1.3
Villupuram	27.4	28.2	**27.8**	12.9	19.9	**16.5**	14.5	8.3	**11.3**	-0.8	-7.0
Total	**25.6**	**26.1**	25.8	17.2	19.2	18.2	**8.4**	**6.9**	**7.6**	**-0.5**	**-2.0**

It is interesting to compare the drop-out rates obtained from the 1993 enrolment figures of class I with the drop-out rates based on grade-to-grade progression rates of the year 1996/97 derived from the EMIS data. In a way such a comparison is valiid, since in both cases, the repeaters are ignored and the number of drop-outs for grade i is determined in terms of difference in the enrolment in grade i of year t and the enrolment in grade i + 1 of year t + 1.

When we compare the two drop-out rates in the states with 4-year cycle of primary education, we actually compare the cumulative effect of the *progression rates* of grades I, II and III for the years 1993/94, 1994/95 and 1995/96 respectively with the cumulative effect of the progression rates of these grades for the year 1996/97. If the drop-out rate has decreased it is due to improvement in progression rates of grade I between 1993/94 and 1996/97, of grade II between 1994/95 and 1996/97 and of grade III between 1995/96 and 1996/97. In the states, where grade V in the last grade of primary level, the grade V enrolment figures of 1997/98 have been used instead of those of 1996/97.

On comparing the drop-out rates based on 1993 cohort and those obtained by the *Apparent Cohort Method* applied to 1996/97 enrolment data, we find that the drop-out rate has decreased in 19 out of 23 districts of **Assam, Karnataka, Kerala, Haryana, Maharashtra** and **Tamil Nadu**. In 4 districts where an increase in the drop-out rate occurred are : Raichur, Mallapuram, Jind and Aurangabad. Of these, only Raichur and Aurangabad are worthy of attention, since in Mallapuram, the drop-out rate was still only 7.9% in 1996/97 and in Jind, the increase was of only 2 percentage points. The unusual decrease in the drop-out rate of Mandya (from 44.4% to -3.4%) is probably due to some fault in the data.

9. CONCLUSION

The study of internal efficiency in the DPEP Phase-I districts, based on the EMIS data of 1996/97 and 1997/98 has provided district level indicators to assess the wastage resulting from grade repetition and dropping out. The input-output ratio exceeds 1.25

in 18 out of 40 districts, showing that 20% or more resources are wasted in these districts due to children repeating grades and/or dropping out before reaching the last grade. The percentage of resources so wasted exceeds 50% in 8 out of the 40 districts. The cohort dropout rate is below the ideal 10% in only 7 districts and it is below 20% in 18 districts out of the forty. The variation in the dropout rates between districts is quite large. It is necessary to intensify efforts to reduce wastage particularly in the districts that have high repetition / drop-out rates.

Due to the lack of data on repeaters for the pre-DPEP years, it was not possible to assess how the internal efficiency has improved in the recent years due to DPEP interventions. However, by estimating the drop-out rates by the traditional method and the apparent cohort method, we find that in 19 out of 23 districts (excluding those of Madhya Pradesh), there has been some improvement in the retention rate over the period 1993-97.

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