CHAPTER II

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In this chapter attempt has been made to study the conceptual issues related to internal efficiency and cost-effectiveness as well as to review literature related to various aspects thereof. But due to lack of sources and time, it was not possible for the investigator to go through the entire published and unpublished researches in the areas related to his study. On the other hand, it is also found that limited research studies have so far been conducted in India and abroad in the areas of internal efficiency and cost-effectiveness at primary level. However, a good number of studies are found to be conducted on school wastage which is a powerful determinant of efficiency and effectiveness of a school system. Some of the studies reviewed in this chapter may not be directly related to the present study, but a brief review of these would stimulate researchers to explore a variety of issues to examine internal efficiency and cost-effectiveness of primary school system. The researcher has reviewed a number of related studies that were conducted in India and abroad and has arranged them systematically in this chapter.

2.1 Concept of Internal Efficiency in an educational system

The concept of 'efficiency', as originally used by economists, refers to the relationship between the inputs into a system (be it agricultural, industrial or educational), and the outputs from that system (be they wheat,
televisions or graduates). Basically, it refers to the quantity of output produced from a given quantity of input. Thus higher the efficiency of a system, the more output it produces from a given amount of input. Here system, according to Khoi (1993, p.5) means a set of interdependent elements, organized for the purpose of attaining given goal and to form a coherent and integrated whole which is greater than the sum of its parts. However, in case of education system, it is not a simple task to measure the efficiency there of, due to difficulties in defining educational output operationally as well as in quantifying the relationship between inputs and outputs (UNESCO Document, 1998, p.13).

The educational planners generally assume that the output of a given cycle of education is the number of pupils who successfully complete the cycle i.e. the graduates. UNESCO Document (1998, p.13) mentions that this is a rather restricted definition since even the pupils who dropped out from an educational system also acquired some of the knowledge and skills which are set out to teach them. Nevertheless, this way of measuring output still gives some meaningful insights into the functioning of an educational system. In this study, the investigator defines output as those students who have completed four years of schooling at primary schools with an assumption that the fact of having passed the courses and examinations means that the student has acquired the prescribed knowledge, skill and attitude. On the other hand, for each year a student spends in school the following inputs are required: a place in a classroom; teacher; curriculum and textbooks; other teaching-learning materials; furniture, equipment and other pedagogical work, etc. All those inputs cost money, which can be aggregated and expressed as
expenditure per student year. One student who spends one year at school is said to have spent one student year. If a student takes more years to complete a particular educational cycle because of the student's repetition at some grades, he or she requires greater inputs that are spent on him or her. Therefore, basic unit of measurement of educational inputs is the student year. Under optional situation, every primary school student should spend one year at each grade level. The UNESCO website (22-06-2005) suggests that the ideal average number of student year of successful completer should be equal to the duration of school cycle. But when pupil repeat grades or dropout, the average number of student year required to move through the cycle exceeds the prescribed number of years. It denotes the inefficiency of a school system because a huge amount of human, material and financial resources are wasted on these pupils. UNESCO Document (1998) describes it as the wasted or missed opportunities for these children in respect of developing their knowledge, skills, attitude, and values that they need for living a productive life in the society and to continue learning. Thus an education system is said to be efficient if it reaches the most desired state by producing maximum number of students who have acquired necessary competencies prescribed by the society with minimum effort and expenditure within a limited timeframe. It should maximize the desired output, both in quality and quantity for a given level of input of resources i.e. human, financial and material resources.

Khoi (1993, p.6) observes that in an educational system, factors of inputs i.e. learners, teachers, knowledge, values, materials, financial resources etc. are transformed in varying degrees by its structure, content
and method to create outputs. The system receives inputs in the form of new entrants, transform these inputs by certain internal processes and finally yields certain outputs in the form of graduates. The inputs, process and outputs are governed by external goals and objectives (political, social, economic, etc.) or by goals and operational objectives specific to the system (quality) (Khoi, 1993, p.6).

Zaidi, S.M.I.A. (1997, p.16) defines internal efficiency of an education system as its ability to educate the maximum number of children who have entered the system in a specific year, in the optimum time with the minimum possible use of human and financial resources. However, an internally efficient education system does not necessarily indicate that the output i.e. graduates will be employable or useful to the society once they leave the system. This is yet another matter of concern for educational planners which could be referred to as external efficiency of the system and to the usefulness or the employability of the school leavers once they are in the job market.

One of the most efficient methods of measuring efficiency of the education system is the students' flow method through Cohort analysis, by which an important synthetic indicator of internal efficiency i.e. co-efficient of efficiency can be calculated. UNESCO Document (1998, p.13) mentions that the co-efficient of efficiency summarizes the consequences of repetition and dropout in the educational process leading to the ‘production’ of graduates. The reciprocal of co-efficient of efficiency is the input-output ratio which is often used as an alternative indicator of internal efficiency of the educational
system. Srivastava, A.B.L. (1999, p.62) shows that when Co-efficient of Efficiency of an educational system is 80, the corresponding input-output ratio will be $\frac{100}{80}$ or 1.25, which means that 25 percent more pupil years are required to produce a certain number of primary level completers, compared to the number of pupil years required for the same number of completers when no one repeats or drops out. Details of method of calculating different indicators of internal efficiency has been discussed in the chapter III.

The Co-efficient of Efficiency is 100 when there are absolutely no repeaters and dropouts in the education system, and all the children enrolled in Grade I successfully complete primary education in 4 years if the primary cycle comprises Class I to IV. But Co-efficient of Efficiency of an educational system in a developing country cannot be 100 percent due to high incidence of dropout and repetition. When Co-efficient of Efficiency is below 100, there is some wastage in the system due to children repeating grades or dropping out from school. Srivastava, A.B.L. (1999, p.62) opined that when the value of Co-efficient of Efficiency is 80 or more, internal efficiency can be considered as satisfactory.

2.2 Concept of cost effectiveness

Cost effectiveness analysis is a form of economic analysis that compares the relative expenditure (costs) and outcomes (effects) of two or more courses, of action. It is a tool that can help to ensure efficient use of investment resources in sectors where benefits are difficult to value.
Thomas, Hywel (1990, p.26) indicates that effectiveness is invariably linked to the outcomes of an activity. Only through an evaluation of the extent to which an activity approximates the achievement of its goals, it is possible to judge how effective that activity has been. Similarly, Hoyle (1980, p.160) mentions that ‘effectiveness is the degree to which an organisation approximates to achieving its goals’. Simkins (1981, p.77) also states that ‘An activity is effective if it achieves its goals’. Ansari (1997, p.90) reiterates that for the purposes of sound planning and effective management of resources, an idea of the degree of efficiency in use of resources is of crucial significance with a view to making appropriate policy intervention to realize the given objectives. It is also useful for gaining an idea for assessing economic viability of educational activities and for ensuring rational allocation of limited resources. There are two important concepts relating to efficiency i.e. technical efficiency and economic efficiency or allocative efficiency. According to Levin (1976) technical efficiency refers to organization of available resources in such a way that the maximum feasible output is produced. That is, no alternative organization would yield a larger output. On the other hand, economic efficiency refers to the use of the budget in such a way that, given relative prices, the most productive combination of resources is used. That is, no alternative combination of resources, given the budgetary constraint, would enable the organization to produce a higher output.

The cost effectiveness analysis is an approach which compares alternative way of attaining the same objective. According to Thomas (1990, p.50) the most cost effective will be the least costly of the alternatives compared, which is not necessarily the cheapest possible method of attaining
the objective, although it might be considered that the most-cost-effective alternative is the most efficient within the limits of our knowledge. Atkinson (1983, p.123) stated that 'it is possible for a programme to be efficient but not cost effective if the output which is actually produced does not contribute to the programme objectives; that is it may be efficient at doing the wrong things. On the other hand, Bray (1989, p.24) states that sometimes it is worth investing more money on a project, choosing a higher cost strategy because it also has higher effectiveness.

According to Atkinson (1983, p.123) cost effectiveness (C.E.) analysis refers to the evaluation of alternatives according to both their costs and their effects with regard to producing some outcomes or set of outcomes. Thus cost effectiveness analysis helps in evaluating the alternative use of resources. Tilak (1997, p.25) mentions that cost effectiveness analysis is used to address only those questions that relate to the internal efficiency of resources invested. It requires the costs to be calculated in monetary terms in the form of unit cost. Here the concept of unit cost means the amount of recurrent expenditure spent per student in a given year. It may be calculated either for the entire educational system or for certain levels of education, or even for particular educational institution or for a particular course of study. It indicates the costs of educating one student for one year at the level of the chosen disaggregation (Ansari, 1997, p.90-91). Hence as a summary statistics, comparison of unit cost from one year to the next or from one institution to another indicates vital aspects of educational finance pertaining to efficiency in use of scarce resources. Tilak (1997, p.25) points out that in cost effectiveness analysis outputs are measured in terms of the physical
output such as levels of achievement, promotion or transition to the next level of education etc. Thus to have an idea of cost-effectiveness, output measured in physical terms is compared to costs incurred to produce such output i.e. unit costs. Bray (1989, p.24) indicates that in education, examination scores are a common measure of effectiveness.

2.3 Studies on internal efficiency, educational wastage and stagnation

The question of internal efficiency of a particular educational cycle has long been viewed by researchers in the context of wastage and stagnation in education. It, however, has the wide connotation of effective utilisation of physical and financial resources available within the particular educational cycle.

A number of research studies have been conducted abroad and within the country with emphasis on different aspects of internal efficiency. Obviously, such studies have concentrated on region-specific and stage-specific approaches. It was observed that there were very limited studies on internal efficiency using pupil cohort method.

Attempt has been made below to review some of the important studies conducted abroad as well as in the country on various issues related to internal efficiency. The studies range from the analysis of the specific problem in the context of a given city to the State and groups of States in the country.
2.3.1 Studies abroad

Heyneman (1984) attempted to analyse critically certain quality issues related to education in developing countries and found that in the poorer countries the average portion of the age cohort attending primary school in 1950 was 37 percent; in 1960 it was 48 percent and in the year of investigation it was over 70 percent. It was mentioned that resources for teaching students had increased dramatically in OECD countries. Netherlands devoted 7.3 percent of its national budget to education in 1950. Ten years later it was 22 percent; and 25 years later 28 percent. Furthermore this rise was occurring along with a rise in the budget itself. Similar ‘double increments’ in educational expenditure was also found in Norway, Sweden, Belgium and the Federal Republic of Germany. Though more resources were devoted to education in those countries, the number of students did not rise proportionally. There was an increase of only 14 percent elementary school students during 1950 to 1970 in Netherland. In Germany there was actually an 8 percent decline in the number of elementary students over the 20 year time period.

Jayaweera (1987) conducted a study to know the steps taken by international agencies and national governments in Asia on creating educational opportunity and to universalise at least the first level of education and found that the resource constraints of economically developing societies have militated against reaching these goals. Statistics of gender-based enrolment at all three levels of education show that equal access of women to education even at the first level is an almost illusory goal for six countries in...
South Asia. Gender disparities in educational participation are seen to be minimal in other countries except in vocational education. It is argued that while economic difficulties are a major constraint to educational opportunity, patriarchal social structures have also operated as a significant barrier in economically disadvantaged countries.

Bredie and Beeharry (1998) examined the likely causes for deteriorating enrolment rates in Africa and found that declining incomes and employment opportunities impact on household schooling decisions i.e. household demand for education.

UNESCO (1998) compiled different indicators of internal efficiency basically using the apparent cohort method for most of the countries of Sub-Saharan Africa, Latin America/Caribbean, Arab States, Eastern Asia/Oceania and Southern Asia. Among countries of Southern Asia, Co-efficient of efficiency at grade V was found to be highest in Maldives (97 percent) followed by Iran (88 percent), and Sri Lanka (87 percent). The co-efficient of efficiency of India at grade V was 81 percent.

Chowdhury et. al. (2003) used field level data from Bangladesh to examine equity levels and trends in primary education including enrolment and quality of learning, focusing on equity for different genders, urban or rural, economic and ethnic groups. The study shows that while some disparity between girls and boys has been eliminated, girls are still far behind boys in terms of learning achievement. Children belonging to poorer families and ethnic minority groups lag behind the respective dominant groups in terms of both enrolment and learning achievement. At the same time, there have been
some improvements for hitherto excluded groups such as rural girls and children of the poor. These changes are attributed mainly to ‘positive discriminatory’ steps taken by the government and non-governmental organisations in favour of such groups.

Okumu et al. (2008) undertook a study to describe the socio-economic determinants of primary school dropout in Uganda with the aid of a logistic model analysis using the 2004 National Service Delivery Survey data. Various logistic regressions of primary school dropout were estimated and these took the following dimensions; rural-urban, gender and age-cohort. The results showed that the distance to school, gender of pupil, gender of household head and total average amount of school dues paid by students influencing dropout of pupils thus showing the profound impact on UPE.

2.3.2 Studies done in India

The acuteness of the problem of wastage and stagnation in India was first pointed out by the Hortog Committee in 1929. The committee was formed by the Indian Statutory Committee to study the growth of education during British period. By applying the enrolment cohort method which is known as ‘apparent cohort’, along with the help of latest statistics available at that time, the Hortog Committee found that out of 5,33,878 pupils studying in class I in 1922-23, only 1,61,228 could reach class II in 1923-24 and subsequently 86,846 reached class III in 1924-25, 55,794 reached class IV in 1925-26. The committee also noted that only 33,588 i.e. 18 out of every 100 pupils enrolled in the schools five years back could reach class V in 1926-27.
After Hortog Committee, the problem of dropout, non-enrolment, stagnation etc. at different level of education have been studied by a large number of investigators. But only a few attempts were taken to study such problems on all India basis. Some crucial findings forwarded by some study are mentioned below:

Sapra (1966) at NCERT conducted a nationwide study to assess the extent of wastage and stagnation at the first level of education. The wastage and stagnation were computed together with the help of enrolment cohort method and found that the total incidence of wastage and stagnation in India at the first level of education was 78.35 percent. This incidence was highest in Grade I and higher among girls than that of boys.

Sarma and Sapra (1969) conducted a study using all India figures of gradewise enrolment and enrolment cohort method and found that the rate of wastage was higher among girls. They also found that the rate of wastage and stagnation remained constant during the past 10-12 years.

A number of studies have been done in different States of India to investigate the problems related to different indicators of internal efficiency. Major findings of some important studies are presented below:

Tilak (1982) in the state of Andhra Pradesh conducted a study on the problem of dropout and stagnation in school education and calculated the wastage with the help of apparent cohort method. The wastage due to dropout and stagnation was not estimated separately by the investigator. It was found that out of the total 100 pupils entering grade I, only 37 could reach grade V and about 11 pupils reached grade X. Out of 100 pupils entering
grade VI, about 44 dropped/stagnate before reaching grade X. The dropout rates were higher in all grades among girls than among boys. At the primary level the differences was about 10 percent. The rate of wastage in rural areas at elementary level was noted higher than that of urban area.

Dhongade (1986) attempted to find out non-enrolment, wastage and stagnation during the first two years of primary school among scheduled caste boys and girls in Soyegaon Taluka of Maharastra. The investigator found that the percentage of non-enrolled girls was higher than that of boys. Most of the teachers in rural areas particularly in SC/ST areas were not trained so teaching was not effective for the students. Social awareness and enthusiasm were also found lacking in them.

SIE, Uttar Pradesh (1986) made a study on dropout and failure in primary classes. In this study attempts were made to find out the causes of dropout and failure among 6 to 14 age group students. The findings show that maximum dropout were from backward classes. The main causes of dropout were illiteracy of the parents, poverty, lack of interest, distance of school from home, unattractive environment of the school, indifference of teachers, irrelevant curriculum, lack of physical facilities like water and sanitation etc. in school.

Gupta and Srivastava (1989) attempted to estimate the extent of educational wastage in terms of stagnation and dropout at primary stage in nine educationally backward states including Assam using reconstructed Cohort Method and found that the overall dropout rate of the primary stage was more than 60 percent in the states of Andhra Pradesh, Bihar, Jammu and
Kashmir and West Bengal, whereas in Assam, Orissa, Rajasthan and Uttar Pradesh it was less than 50 percent and in the case of Madhya Pradesh, it was around 58 percent. More than 60 percent of the pupils completed the cycle without repeating in Jammu and Kashmir, Orissa and Rajasthan, whereas in the states of Andhra Pradesh, Assam, Bihar and West Bengal only about one-third of the pupils completed it. In all the states three-fourths of the total years spent in excess are attributable to dropouts while remaining are attributable to repeaters who have completed the cycle.

Bhargava (1990) made an attempt to investigate the growth and development of education at the primary and the middle stages in India. It also attempted to examine the problem of education of girls, and of SC and ST using the document survey technique. The study covered a span of 40 years. But state-wise analysis of growth of education was done from 1973 to 1986. The study reveals that there had been a steady growth of educational facilities at the primary stage. In 1957, 59.75 percent children had schooling facilities within a distance of one kilometre, but this was available to 80.34 percent in 1986. Among the states, Nagaland had the highest and Tripura, the lowest facilities. The other states that followed Nagaland were Mizoram, Gujarat and Punjab. Educational facilities for girls and ST and SC improved from 38.05 percent in 1978 to 74.46 percent in 1986. Middle stage education facilities within 1 Km. has also increased from 3.13 percent in 1957 to 13.25 percent in 1986, and Junagadh District (Gujarat) had the highest facilities for middle stage education. At the elementary stage (I-VIII), 1,139 lakh children were enrolled in 1986, and this showed a 51.43 percent increase over 1973 with an annual growth rate of 3.24 percent. However, crores of children were
out of school and only 30.07 percent of those who got enrolled in school reached Class VIII.

Buch and Sudame (1990) examined the status of the primary education programmes in selected urban areas in Gujarat using descriptive survey method and found that a large number of the primary schools in the urban areas of the State had faced shortage of space. Many of the schools were located in regions which were either prone to heavy traffic and noise pollution or with unhealthy surroundings and were frequented by anti-social elements. The schools did not have necessary infrastructure such as school buildings, toilet facilities, drinking water, library and laboratory facilities. The education system, school related factors, social factors, family and individual related factors were found to be responsible for the phenomena of non-enrolment, non-attendance and wastage. The study noticed a decreasing trend in the rate of wastage and stagnation.

Govinda and Varghese (1991) conducted a study to analyse the various aspects of quality of primary education in India taking a sample of 59 schools, 111 teachers and 2,159 learners. The study reveals that the level of infrastructural facilities provided in the schools played an important role in improving the teaching-learning environment and, consequently, learner achievement levels and overall school quality. The study shows that a trained teacher made considerable difference in terms of teaching style and classroom management. The performance of schools with one teacher per grade tended to be better than that of schools involving multigrade teaching.
Better physical facilities, specially in terms of teaching aids and equipment and their proper use were found desirable for good results.

Padhan (1991) attempted to study what primary schooling is expected to produce and what is actually produces. The objectives of the study were to examine the expenditure as an input from different sources on pupils and staff as well as to analyse the production function of elementary education by examining the output of education compared with the input. The researcher worked out internal efficiency covering wastage and stagnation, costs for estimating the waste of resources, efficiency index and assessment of production function. The findings of the study indicates that the major expenditure came from the government and minor expenditure was incurred by the students. An average of 31 percent of resources were wasted due to dropouts and stagnation. None of the variables, i.e. school-cost, teachers' qualification, experience and the students' SES had a significant impact on the scholastic achievement of pupils when the effect of the remaining variables were held constant.

Yadav (1991) made an attempt to investigate the causes of dropout among the socio-economically deprived sections of the society using survey method. The investigator identified the following factors highly contributing to the phenomena of dropout in descending order of significance : the non-detention policy of the government in classes I and III; dropout during sowing and harvesting sessions; poor interest of students due to heavy syllabi; illiteracy of parents; punishment at school; poor individual attention in over crowded classes; large family size in poor families; and poor teacher-pupil
relationship due to frequent transfer of the teachers. The main findings on students' perception of casual factors of dropout were: punishment by teachers; use of guides by teachers instead of textbooks; ignorance of parents about the importance of education; and poverty.

Gyaneswar (1992) studied the issues related to retention of pupils in one class for more than a year and the consequent dropping out of pupils from school before completing the prescribed course in a randomly selected sample of fifty schools drawn from Bishenpur district of Manipur. The researcher found that the rate of wastage and stagnation amongst pupils in rural schools was higher than that amongst urban schools. The rates of wastage and stagnation amongst boys, girls and Scheduled Tribes in rural schools were 40.9 percent, 55.2 percent and 92.8 percent respectively. They were higher than those in urban schools, viz. 25.6 percent, 21.8 percent and 75.0 percent respectively. The study reveals that for every 100 children enrolled in class I, only 69 percent reached class V during 1984-85 and for boys and girls these figures were 72.4 percent and 68.8 percent respectively. The rate of repetition was generally higher in the upper classes. In 1980-81, the base year in class I, it was 0.97 percent, while in the consequent three upper classes II, III and IV, the repeaters' percentage rose to 3.67 percent, 6.75 percent and 6.48 percent respectively.

Indian Institute of Management (1994) made an attempt for evaluating the status of primary education in Assam. For this study a field survey was conducted on the basis of stratified circular systematic sampling for rural Assam and stratified simple random sampling for the urban areas.
The findings of the study show that in Assam, in the age group 5+, 61.67 percent are literate. The rate of literacy is highest among male (69.43 percent). In the state about one fifth of the children in the age group 6 to 9 were never enrolled in any educational institution. The proportion of non-enrolled children was higher among female than among male. Highest incidence of non-enrolment was recorded in ST (hills rural). In both Gross Enrolment and Net Enrolment Ratio the gender inequality was very evident. The study shows that the rate of dropout was slightly higher among female (18.52 percent) than that of male (15.66 percent). Most of the dropout cases (nearly two third) occurred in class I itself. Golaghat district was an exception, where more than two third of dropping out occurs after passing class I. The most notable single reason reported for non-enrolment and dropout for children 6 to 9 years was “not interested in Education”.

Srivastava (1999) studied the indicators of internal efficiency for 1996 and 1997 using the enrolment data of 1st phase DPEP-EMIS with the help of Restructured Cohort method. It was found that out of the 40 DPEP phase I districts, the number of districts with co-efficient of efficiency (C.E.) equal to or above 80, increased from 19 in 1996 to 27 in 1997. On the other hand, the number of districts with poor internal efficiency i.e. C.E. below 70 decreased from 9 in 1996 to 6 in 1997. In 15 districts, the internal efficiency increased substantially between 1996 and 1997 (that is, C.E. increased by 3 or more percentage points); in another 16 districts, it remained the same (that is, C.E. increased or decreased by less than 3 percentage points); and in 6 districts, C.E. decreased by over 3 percentage points. For the remaining districts, investigator could not make comparison due to lack of relevant data.
Cohort Dropout Rate (C.D.R.) was between 4 to 32 percent in about three fourths of the districts in 1997. It was less than 20 percent in 19 districts and less than 10 percent in 8 districts. In 15 districts, the C.D.R. decreased by over 3 percentage points between 1996 to 1997; it remained almost the same in 11 districts and increased by more than 3 percentage points in 12 districts. So far as the 7 districts of Kerala and Karnataka were concerned, the Average Duration of Study (ADS) for the graduates was in the range of 4.1 and 4.3 years; in the 3 districts of Assam, it was high in the range of 4.6 to 5.1 years. It was noted that ADS has either remained the same or has declined slightly in all the districts, including those of Assam and Madhya Pradesh, where the dropout rate was generally high. It was found that there had been a decline in repetition rates in almost all the districts between 1996 and 1997, while the dropout rates had decreased or remained constant in some of the districts but had increased in others between 1996 and 1997. Only in 13 districts out of 40 districts, CDR of girls was greater than that of boys by more than 5 percentage points in 1997. In 25 districts, the gender disparity in CDR was less than 5 percentage points. Annual Dropout Rate (ADR) in 22 out of 40 phase I districts was less than 5 percent and more than 10 percent in 5 districts. All these high dropout rate districts were in Assam and Madhya Pradesh.

Shardindu (2004) attempted to examine different process indicators at primary level such as completion, dropout and repetition rates and gender and social group disparities thereof in 32 DPEP-III districts of Uttar Pradesh. The researcher used retrospective Cohort method taking grade I student of 1995-96 academic session as starting cohort which was followed individually
for a maximum period of six years. A child who had dropped out in a particular year was not followed up any further. Similarly, the transfer cases were not taken into account and were excluded from the study. The study reveals that only 29.55 percent of children of grade I in 1995/96 could complete grade V successfully in the minimum period of 5 years. The overall Cohort Dropout Rate (CDR) was found to be 56.48 percent. It was slightly higher for boys (57.68 percent) compared to that of girls (54.89 percent). The CDR was lowest for SC category of students and highest for those belonging to Muslim Minority community. The highest repetition rate was in grade I (53.91 percent) and lowest in grade V (3.73 percent).

Mehta (2005) attempted to know the various aspects of elementary education in India with the help of DISE state specific data. Using such data for the year 2003 and 2004, student flow rates as well as indicators of internal efficiency of the primary school system were computed for 15 states including Assam. Reconstructed Cohort method was used to obtain the indicators of internal efficiency of the system. The co-efficient of efficiency was defined as the ratio of actual number of pupil years to the ideal number of pupil years. Ratio closer to one means the better internal efficiency. The average of 15 states indicates that, barring a few states, the majority of children in 2003 were promoted to the next grade across primary classes. On an average about 80.50 percent children were promoted to the next grade and no significant difference was noticed between boys (80.70 percent) and girls (80.30 percent). 87.4 and 89.3 promotion rates were recorded in Assam for male and female respectively which were higher than that of all states average. Similarly repetition rates for male, female and both in Assam i.e. 7.5,
7.2 and 7.3 respectively were less than corresponding all states average i.e. 8.8, 8.4 and 8.3. On the other hand, dropout rates in Assam for male, female and total were 5.1, 3.5 and 4.4 respectively, which are significantly lower than that of all states average. The co-efficient of efficiency (2002-03) of primary education system (15 states together) was found to be efficient to the tune of only 76.9 percent. There was good scope of further improvement as 23.10 percent of the total resources had gone waste. In case of Assam, though the total co-efficient of efficiency i.e. 82.90 was higher that that of all states average, students on an average were taking 6 years to complete the primary schooling. Likewise in Assam co-efficient of efficiency for male and female were recorded as 82.10 and 83.70 respectively. The primary school system of Assam was found to be less efficient as compared to that of Himachal Pradesh, Karnataka, Orissa, Tamil Nadu and Uttar Pradesh.

Ed. CIL (2006) published a report to present synthesis of findings of three studies aimed at estimation of incidence and causes of repetition in primary schools and primary stage of upper primary schools. These studies were conducted during 2003-04 in the States of Gujarat, Haryana and Himachal Pradesh, which were known to have high incidence of repetition at primary stage. The Gujarat study covered 204 schools of 3 DPEP districts; the study of Haryana included 197 schools of 2 DPEP districts and 240 schools of 3 DPEP districts of Himachal Pradesh. A two-stage stratified random sampling procedure was used for selection of schools. The studies reveal that overall grade-wise repeater rates during 2001-02 varied from 24.2 percent for class I to 14.3 percent for class IV in Gujarat, 18.3 percent for class I to 7.2 percent for class V for Himachal Pradesh and 8.4 percent for class II to 11.0
percent for class IV for Haryana. There was some decline in repeater rates over the period of 4 years (1998-99 to 2001-02) in Haryana and Himachal Pradesh. Further, repeater rates for boys and girls were almost equal but they were higher for ST in Gujarat and SC in Haryana than those for other children. The report also indicates that average percentage of marks obtained by repeaters in terminal class of primary stage were less by 30 percent points than that of non-repeaters. Students' strength in a section varied from 19.0 in Himachal Pradesh to 38.9 in Haryana and the pupil-teacher ratio in Haryana was the highest (58.4), and the same was lowest (26.4) in Himachal Pradesh. Direct academic support to schools from DIET and BRCs was not available to more than 78 percent schools and 50 percent schools respectively. Cluster Resource Centres (CRCs) in Gujarat provided '4 or more times' academic support during 2001-2002 to 90 percent schools. Position in respect of such support from CRCs was not so good in Haryana (25.7 percent) and Himachal Pradesh (34.2 percent). Over 70 percent teachers gave maximum importance to one or the other of the three reasons of repetition, namely (a) poor living condition at home, (b) no one helped child in study at home, and (c) much load of domestic work.

Mehta (2006) examined the different indicators of internal efficiency of school system of 25 States using reconstructed cohort method with the help of DISE data for the year 2004-05 and found that the primary education system of the country is efficient to the tune of only 87.8 percent. It indicates that there is good scope of further improvement as 12.2 percent of the total resources have gone waste. In Haryana (41.1 percent) and Uttar Pradesh (44.3 percent), the co-efficient of efficiency obtained was much below than the
average of all States. More than 55 percent of resources in these States were
going waste. In Mizoram (99.6 percent), the primary education system was
found to be most efficient among all States followed by Kerala (90.9 percent).
The co-efficient of efficiency for Assam (80.7 percent) was far below the
national average (87.8 percent). On an average a primary graduate was
taking 6.8 years to become primary school graduate compared to ideal 5
years. Students in Meghalaya were taking 11.4 years compared to 14.6 years
in Haryana which clearly shows that the primary education system in these
States was highly inefficient ones. This was also reflected in the input output
ratio which indicates a student was taking more than double time resources in
these States to become primary school graduate.

2.3.3 Studies done in Assam

A few studies so far have been done in the State of Assam to
examine wastage and stagnation at elementary stage.

Das (1969) applied enrolment cohort method to compute wastage
and stagnation at the Primary level of education in the State of Assam. The
total incidence of wastage and stagnation was termed as wastagnation. The
investigator found that the average rate of wastagnation for pupils at Primary
level in the State was 77.12 percent. This wastagnation had been taken place
on account of combination of two main factors – grade repetition and school
dropouts. The average rate of total wastagnation at the Primary level for girls
(82.27) percent was higher that that of boys (73.87 percent). The rate of
wastagnation in the State remained as constant since 1951-52. The rate of
wastagnation was higher in first year of schooling. Seven important causes of
wastage for the State of Assam were identified as follows: poverty, ignorance of parents and guardians, utilizing the services of children by their parents in general, poor health of pupils and physical debility, parent's and guardian's inability to provide reading materials, bad social environment and backward society.

SIE, Assam (1988) conducted a study to examine dropout rate at Primary level on all Assam basis using stratified random sampling technique. Investigators selected a total of 1200 Primary schools, which was 4 percent of the total number of Primary schools of the State. The true cohort method was applied to compute wastage and stagnation. Each child enrolled in class I in 1975 was followed for ten years so as to find out the number of students regularly completed the course of Primary level and how many of them remained as repeaters and how many of them left the school without completing the course. It was found that the rate of dropout was highest in class I and it was higher in case of boys in all classes than that of girls. The category wise rate of dropout was highest in ST areas (24.59 percent) followed by tea garden area (20.91 percent). Highest rate of dropout was recorded in Mangaldoi sub-division (29.40 percent).

Sarma (1992) undertook a study to identify the actual causes of the non-enrolment and non-retention of the tea garden labour community children in undivided Sibsagar district of Assam and identified the following four causes responsible for non-retention and non-enrolment of tea garden labourers' children: involvement in domestic or non-domestic work; parents' unawareness of the importance of education; home environment not
congenial for education; parents' inability to provide materials needed in school. According to teachers, difference in the language spoken at home and at school was another important cause of their educational backwardness. Irregular attendance of pupils caused the maximum problem for the teachers in teaching-learning process.

Sarma (1993) conducted a study in order to find out the extent and causes of wastage and stagnation among tea garden labourers of Jorhat and Sibsagar district of Assam in Primary level of education. Multistage stratified sampling technique was adopted for selection of the sample. The true cohort method was utilized by the investigators for computing wastage and stagnation. The investigators took 1981 as base year and fresh entrants in grade I in this year and formed the cohort. The cohort was followed for ten years to study each pupil because some of the pupil took 9 years to complete the stage. The rate of wastage due to dropout was noted 42.88, wastage due to stagnation was 33.34 causing gross wastage rate 76.22. The rate of regular promotion was only 22.97 percent. The gross wastage for boys and girls was almost equal, but dropout rate was higher for boys than that of girls. Dropout rate was found highest in grade I and least in grade IV. Academic causes ranked first in respect of wastage due to dropout followed by economic and social reasons. Though in the study, the causes were categorized into different category, it was found that they were interlinked. A miscellaneous cause like irregular attendance was an outcome of economic and social causes. It was noted that teachers showed indifferent attitude towards education of the labour children. The parents were also not at all concerned with education of their children.
The Baseline Assessment Study (NCERT, 1994) was conducted in four districts of Assam (Darrang, Dhubri, Karbi Anglong and Marigaon) using multistage sampling design and found that overwhelming percentage of dropout in all districts were from rural areas. Only exceptions were in Morigaon and Dhubri districts where 7.10 and 1.60 percent urban dropouts constituted the sample. The sample constituted of marginal percentage of dropout pupils of the underage group and substantially high percentage of overage group. The dropout rate was maximum in case of ST in all the district except in Darrang. Large percentage of dropout pupils in all district were from families having illiterate mothers. Inability of the parent to afford textbook / notebook and house hold work were found major reasons for dropout. Besides these, another factor say 'will have to earn a living' have constituted for good percentage of dropout among girls. The study also reveals that in lower classes the enrolment of pupils was in favour of rural areas but in higher classes (class III and IV) the enrolment went in favour of urban areas. Most of the dropouts repeated one or the more classes at least once in all the districts.

Buragohain (1997) attempted to capture the major determinants of enrolment, non-enrolment, dropout and child labour with the help of quantitative techniques. An attempt was also made to discern the pattern of their relationship with other socio-economic variables like family size, household income, population below poverty line, literacy rate, private expenditure on education, schools within habitation and mid-day meal scheme for which a correlation matrix was developed. The study reveals that education of the parents or educational development of a region has greater influence than
household income on education of the children and child labour. The study reveals that non-enrolment, dropout and child labour were directly related. It was notable that the higher the non-enrolment the higher will be the dropout. Again, dropout, non-enrolment and child labour were inversely related with educational development of the region as well as the household income.

Sarma (1997) conducted a study in Jorhat district of Assam using a Stratified random sampling technique for identifying the existing trend of enrolment and dropout along with the reasons for non-enrolment and dropout particularly of girls at Primary level of education across urban, rural and tea garden areas. Dropout rates were calculated with the help of student’s flow chart. The findings of the study reveals that a significant portion of girls of school going age group in Jorhat district is still remained out of school. Gross Enrolment Ratio for boys, girls and total were 111.07, 88.06 and 99.55 respectively. A decreasing trend in enrolment of boys and girls was observed during the recent past in all the three categories of schools. Retention rate for grade IV was higher in case of boys than that of girls. Dropout rates for girls were substantially higher in all classes. The extent of dropout was highest among girls of tea garden. Major reason for non-enrolment and dropout among rural and tea garden girls were poverty and household activities. A substantial number of girls have to be engaged in earning a livelihood. The irrelevancy in education along with unattractive teaching learning atmosphere adversely affect the interest and attitude of children and parent towards education.
Sarma (2000) attempted to examine some of the synthetic indicators of quality education at Primary stage such as co-efficient of efficiency, input-output ratio, unit cost, cost-effectiveness, wastages due to dropout and repetition, survival rate, teacher pupil ratio etc. using a stratified random sampling technique. The findings reveal that the urban schools were operating at 94 percent efficiency level and wasting only 6 percent of its resources on repeaters and dropouts. Whereas schools of rural and tea garden area were functioning very inefficiency, wasting 23 and 62 percent of their resources respectively. Only 8.13 and 40.80 percent of pupils in tea garden and rural schools respectively were found to have reached grade IV without repetition. 37.65 percent of pupils enrolled in grade I of tea garden schools discontinued their studies in the same year. Only 28.61 percent of the cohort of pupils in that school eventually reached grade IV. It was also observed that dropout was primarily evident in the lower classes. More number of teachers in small size schools increased that total annual recurrent expenditure resulting in the highest unit cost in rural area. However rural schools were more consistent in unit and effective cost. But in tea garden schools, unit and effective cost vary to the extent of 66.68 and 56.84 percent respectively indicating very high variability among the schools. The urban schools were found to be most cost – effective (98.66 percent) as compared to rural (81.13 percent) and tea garden schools (59.47 percent). Low level of educational qualification of teachers along with uneconomic size of school and low rate of pass out contributed towards low level of school efficiency.

Borbora and Dutta (2008) conducted a study to assess dropout rates at primary, upper primary and elementary stages and to find out the
reasons there of covering five districts of Assam using simple random sampling. The study reveals that the phenomenon of dropout existed in L.P., U.P. and elementary stages and the persistence of dropout was comparatively higher in the lower classes than in higher classes. The sample schools did not have suitable infrastructure though they have comfortable pupil teacher ratio ranging from 20:1 to 25:1. Major reasons for dropout are lack of interest in studies, poverty, lack of encouragement from parents, engagement in domestic chores, engagement in outdoor economic activities, physical disability etc. The study shows that about 67.69 percent of the dropouts are slow learners and 6.15 percent of the dropouts have physical disability.

2.4 Studies on cost-effectiveness and related issues

With increasing number of school going age group population as well as expanding scope of educational activities, coupled with decreasing availability of per capita resources, researchers take the challenge of finding out ways of effective utilisation of financial resources through prioritising investment. However, such studies were largely related to higher education. Here attempt is made to review some of the important studies conducted abroad, in the country and in the State of Assam on cost-effectiveness and analysis of unit cost at elementary stage.

Dutta (1971) studied the unit cost of education at primary stage in Haryana and found that the capital cost came to Rs. 365.00 per school per year or Rs. 2.20 per student per year. The equipment cost was Rs. 97.00 per school per year or Rs. 0.60 per student per year. The non-divisible recurring
cost on pension, allowances etc., electricity charges, part time servant charges, repairs, postage, stationery, examinations, social functions, furniture etc. was Rs. 13971.00 per school per year or Rs. 84.15 per student per year. The divisible recurring cost on scholarship, freeship, etc. was Rs. 48.00 per school per year or Rs. 0.30 per student per year. Student cost on tuition, fee, funds, textbooks, stationery etc. was Rs. 16.10 per student per year. The opportunity cost was Rs. 140.60 per student per year. The total visible expenditure per student per year was Rs. 21 per year per student. The total of visible and invisible expenditure per student per year was Rs. 276.

Hanushek (1972) conducted a study using two data sets related to a single California school system and a sample of urban schools in the northeast and the Great Lakes region of USA and found that the importance of quality and quantity of school inputs was more interesting than the importance of family background. The researcher points out that differences in per pupil expenditures will not be systematically related to differences in student achievement, because school funds are not spent to purchase those inputs that have important effects on student achievement.

Dandavate (1986) attempted to study cost of primary education in greater Bombay and found the size of the school, teachers' salaries per pupil and maintenance expenditure acted as major determinants of primary school costs. Among aided and unaided schools, the proportion of school maintenance expenditure per pupil to unit cost had come down, while in case of municipal schools it had increased over the period under study. At constant prices, teachers salary per pupil as well as unit cost increased in all the
schools over the period of 20 years under study. Highest per child expenditure was Rs. 96 per month in case of English medium schools. The cost of education on the part of parents of private schools was higher than that of municipal schools because of no fees, no transport charges, less expenditure on books in municipal schools.

Sarma (1996) made an attempt to examine Cost-effectiveness of government primary schools in a sample of 22 urban schools of Jorhat town. Cost-effectiveness of the individual schools was computed as a ratio of unit cost to effective cost. Here effective cost is the ratio of total recurrent expenditure in the year to the total pass out in that year. It was found that average unit cost of sampled schools was Rs.2461. The size of schools and teacher pupil ratio were the major influencing factors of unit cost. Highest percentage of recurrent expenditure was on the salary of teachers. 83.36 percent schools were running below 30 percent level of cost-effectiveness. No school was found to have 50 percent or more cost-effective level. Qualification of teachers was found to be positively related to the cost-effectiveness of schools. However, length of experience and training of teachers were not related positively at significant level with cost-effectiveness.

Mehrotra and DelaMonica (1998) conducted a study for analysis of the cost of primary education in five countries viz. Burkina Faso, Bhutan, Myanmar, Uganda and Vietnam and noted that high total cost countries were found to have low enrolment. High total costs resulted from high teacher wages. High private costs induced a large gender gap in outcome indicators and countries with high enrolments but low absolute public expenditure on
education face serious difficulties in maintaining quality and ensuring completion of the primary cycle. Some policies aimed at reducing cost, raising more resources and increasing efficiency were also analysed.

Tyagi (1996) attempted to analyse the disparities persisting in the per pupil cost of elementary education in different states and union territories and found that on an average per pupil cost varied to the extent of 54.52 percent in 1975-76 which was further increased to 60.77 percent in 1980-81. The co-efficient of variation for per pupil cost in 1985-86 and 1990-91 was however, declined to the extent of 53.93 percent and 49.45 percent respectively. Despite the declining trend the variation among the states was a cause of concern as the extent of variation was about 50 percent.

Colclough and Al-Samarrai (2000) analysed public spending on education in Sub-Saharan Africa and South Asia with a particular focus upon primary schooling. The study shows that the achievement of high enrolment ratios has been associated not only with high priority being assigned to public expenditures on primary schooling, but also with the presence of modest unit costs of schooling. The paper argues that schooling for all is achievable, even in countries which are among the poorest, and where school enrolments are very low, provided government are willing to reform both the private and public costs and efficiency of school system, and to give expenditures on primary schooling their proper priority.
2.5 Conclusion

Forty one research studies have been reviewed in this chapter. Out of which thirty two have been carried out in India and nine in abroad. Further, it has also been found that only six research studies are directly related to present investigation because they were carried out to examine the internal efficiency and cost-effectiveness of school system.

After reviewing various studies conducted in India and abroad, the investigator feels that the present research work is justified on the ground that in our country very few studies have so far been undertaken pertaining to internal efficiency and cost-effectiveness at primary school level.

On the other hand, to the best knowledge of the researcher, no study has yet been conducted in Assam during last fifteen year to examine internal efficiency at primary schools using true cohort method which is considered as best technique for calculating internal efficiency of a school system. Moreover, except two seminar research papers, no research study has been conducted in Assam for examining internal efficiency and cost-effectiveness at primary level. It is also a fact that a good number of interventions have been given in our State for qualitative improvement of elementary education under Sarva Siksha Abhiyan. But no study has been found to have conducted even after six years of implementation of SSA to examine them systematically. Hence, the present study is timely and relevant.

The findings of different studies that have been reviewed above give the present investigator an ample opportunity and sufficient scope for designing a systematic plan, formation of objectives, defining key words,
identifying sources of data, construction of tools for data collection and having a worthwhile starting for the present study. It is realized that sincere and careful study of the published and unpublished materials has made this research endeavour more meaningful and this has guided the investigator to serve the purpose of the present investigation.
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