

SOME PRELIMINARY CONSIDERATIONS

1. FACTORS DETERMINING THE GROWTH OF SCHOOL ENROLMENT

School enrolment is expected to grow in any dynamic situation where the population is continually increasing, or the school system is progressively expanding, or where both developments are taking place. On the contrary, where population growth or school expansion is arrested, in any temporary or local situation, then the number of children attending school may remain unchanged or show signs of decrease. Thus the two factors which basically determine the size of the future school-going population are: (1) the expected growth of the population, or more precisely, of the school-age population; and (2) the anticipated expansion of the school system which may result from other developments than the mere growth of the population.

The overall growth of a country's population is mainly due to the natural increase resulting from the total number of births less the total number of deaths in a given period. Where there is no substantial migration of people in or out of a country, the rate of population increase may be calculated by taking the "crude birth rate" (number of births per 1,000 population) and subtracting from it the "crude death rate" (number of deaths per 1,000 population). The annual number of marriages, and the age of persons at marriage, would have an influence on the number of births to be expected. Of particular importance in estimating the number of future births is the proportion of married women of child-bearing age (say between the ages of 15 and 45 years) in the total population. Thus the use of a crude birth rate is not always satisfactory.

Similarly, the crude death rate, which is also related to the total population, conceals the marked differences in the mortality of persons in different age groups. For instance, more children by far die during their first year of life than at any subsequent age. Childhood mortality declines to a minimum perhaps around 10-14 years of age. Chances of death then increase with advancing age during the adult years. In most countries, mortality for females is likely to be lower than for males at corresponding ages. Therefore, in order to estimate the size of the future population it is necessary to take into consideration the specific rates of death for each sex and at each age.

For the purpose of estimating future school enrolment, special attention must of course be given to the population in the school-going ages. There is no uniform definition of the school-age population for all countries. This depends for each particular country partly on the legal age limits of compulsory education (if there is compulsory education) and partly on the structure of the school system, in terms of the usual age at entrance and the duration of each level of education (whatever may be the legal requirements for compulsory education).

In countries or in areas where there is considerable in- or out-migration, allowance must be made for the number of persons, especially the number of children of school age, who may be included among the migrants. Sometimes it may be necessary also to take into consideration the number of children expected to be born of persons migrating in or out of the country or area for which we are to estimate future school enrolment.

We shall now briefly mention some of the non-demographic factors which have a bearing on the size of the future school enrolment. In a country where education is not compulsory by law, or where legal provisions for compulsory education are not fully carried out, the number of children attending school will depend, among other things, on the choice and convenience of parents, the availability of school facilities, and the possibilities of employment for children and for adults with varying amounts of schooling. Any attempt on the part of a government to introduce or more fully to enforce compulsory schooling will obviously bring about a higher level of school enrolment or school attendance. If compulsory schooling were to be extended by raising the legal school-leaving age, or if there were a tendency for children to remain in school longer than they are required by law, the size of school enrolment could change very substantially as a result.

In many developing countries the proportion of girls attending school is consistently lower than the proportion of boys. More emphasis on the education of girls would naturally increase the total number of children enrolled in school. Similarly where school enrolment is markedly lower in rural areas than in urban areas, increased efforts directed towards rural schools could also result in greatly increasing the total school enrolment.

Two sources of wastage in school enrolment may be noted in view of their effects on the size of total enrolment. The first is the tendency, commonly found in almost all countries, for children to drop out of school before the completion of a prescribed course of study, say at the primary or secondary school level. If the drop-out rate could be reduced, that is, if the schools could keep more children in school for a longer time, or still better, if most or all of the children entering school at a given level were to remain until they complete the prescribed course at that level, the immediate effect would be to increase the total school enrolment, even if there were no increase in the school-age population or in the number of children entering school for the first time.

The second source of wastage is the very common practice, especially in the developing countries, of keeping children in the same class or grade because they fail to be promoted at the end of a school year. This requirement for children to repeat their grades, usually justified in terms of maintaining school standards, may actually be one of the causes of early school-leaving. Hence a reduction in the number and proportion of repeaters could lead to a decrease in the drop-out ratio and a corresponding increase in the total enrolment. Furthermore, a systematic reduction leading to the eventual elimination of the practice of non-promotion would have the effect of breaking a traffic jam, thus making room for more children to enter the schools and to progress regularly through the grades.

The factors mentioned above - natural increase of population, influx of migrants, enforcement of compulsory education, raising of school-leaving age, increased enrolment of girls, development of rural schools, reduction of drop-outs, elimination of non-promotion - all seem to point to an inevitable increase in total school enrolment, especially in a developing country. There are, however, some limiting factors which may tend to counteract the effects of those influences towards growth and expansion of the school system.

In the first place, an expanding school system requires an ever-increasing number of adequately trained teachers. Even if there were no increase in total enrolment, a school system must recruit new teachers every year to replace its losses due to death, retirement, change of profession, marriage of women teachers, and other causes. New and better trained teachers must be found to take the place of under-qualified members of the existing staff. If the present school system suffers from too many oversized classes, due to a shortage of teachers, any improvement of the situation would require still more teachers. The need for additional teachers may be urgent if, as often is the case in many developing countries, double sessions of children are accommodated in the same school - for example, a morning

and an afternoon session - often taught by the same body of teachers. Any increase in pupil enrolment would call for more teachers, over and above all existing needs such as those we have just described. Considering that the adequate training of teachers requires several years, there is evidently a limit to the possibility of expansion of a school system, determined by the potential supply of teachers, apart from other considerations.

Another limiting factor, so well-known and painfully felt in most developing countries that its mere mention is enough for it to be recognized, is the persistent shortage of school buildings and related facilities. The expediency of conducting double sessions in the same school has already been noted. Use of buildings unsuitable for school purposes is another common situation. Unless and until present needs for school buildings and related facilities can be met adequately, how could it be possible to envisage further expansion in terms of pupil enrolment - only to aggravate the existing problems?

Finally, all plans and proposals for expansion of the school system must unfortunately be subject to the limitation of economic and financial considerations. To what extent can a nation's total expenditure for education be increased without overtaxing its economic resources? What share of the costs of education should be borne respectively by the public authorities, private organizations and individual citizens? If resources are limited, what priorities should be given to the claims for development of the various levels and types of education - as for instance between primary and post-primary education; rural and urban schools; general and vocational education; the preparation of teachers and of other types of professional workers? Such questions are not easily answered, but they must be taken into consideration by the administrators and policy-makers in regard to the future development of the school system.

Thus it may be seen that there are in reality three sets of factors which mainly determine the trends of future school enrolment. We may call them the demographic, educational and economic factors. In the following chapters of the present *Manual*, we shall however confine our attention to the effects of various demographic and educational factors as they influence the growth of school enrolment. We do not mean to ignore or minimize the importance of economic factors in educational development, but it so happens that the main concern of this *Manual* - a methodology for estimating future school enrolment in developing countries - carries us more directly into the fields of demography and education; further consideration of the inter-relationship between economics and educational development, including estimation of the costs of education, must await the possible appearance of another work.

2. NEEDS FOR ESTIMATING FUTURE SCHOOL ENROLMENT

Some of the very factors influencing the growth of school enrolment, as mentioned above, point up the need for carefully prepared estimates of future school enrolment. Such estimates would help to avoid the risk of unexpected surprises, haphazard guesses, or impractical policies adopted without sound bases. In short, as educational planning is essential to well-balanced economic and social development, so are estimates of future school enrolment an indispensable element in educational planning.

It may be argued that a developing country usually lacks many of the basic data required for estimating future school enrolment; consequently there are so many uncertain factors in the situation as to make any attempted estimates unreliable and largely a wasted effort. Our answer to this argument would be that the less we know of the past trends and present tendency in this essential area of national life, the more need there is for careful planning ahead, based on the best possible estimates that can be obtained. While a country relatively well-developed in education might coast along without serious consequences, a less-developed nation trying to make up for lost time can ill-afford to drift without map or compass.

In the next chapter we shall set out to examine the types of basic data required for estimating future school enrolment. Where we do not find all the relevant facts and figures readily at hand, we must resort to certain assumptions, substitutions and compromises in order to arrive at some reasonable estimates. As time goes on, and as more statistical and supporting data become available, these first estimates can be revised and brought up to date. This course of action would be more advisable than the postponement of all action because of deficiency of basic data.

Let us look more closely at the ways in which estimates of future school enrolment would be useful to those who are responsible for the administration and planning of education in a developing country.

One of the principal duties of a school administration is to provide teachers, adequately trained and sufficient in numbers, to carry on the work of teaching a whole generation of boys and girls of school-going age. A serious shortage of teachers may often be the result of failure to anticipate the growth of the school-age population. With a rapidly growing population, an ever-increasing number of teachers will be needed just to keep a country's education at the same level. If there is to be any raising of the educational level - as would naturally be the hope of any developing country - then the

number of teachers must increase at a faster rate than the number of school-age children. Since teachers cannot be produced instantly on demand, the far-sighted administrator would want to know just how many new teachers must be trained in the years to come. The answer will depend in part on how many children will have to be taught. Therefore the potential school enrolment must be estimated in advance.

Similarly, the administrator would want to know how many and what kinds of schools must be built or otherwise provided. Though it would take less time to build a school than to train a teacher, still plans must be made early enough to enable budgets to be submitted and approved, funds to be appropriated and other steps to be authorized by the proper authorities. For this purpose, the future school enrolment must be estimated in some detail as to the level of education, type of school, and even the area or locality involved.

If further planning is needed in such matters as the supply of living quarters for teachers and students, transportation for pupils in rural areas, procurement and distribution of food items for school meals, printing and distribution of school books, and the provision of other essential services, then a whole series of enrolment estimates may be necessary, including the sex, age and grade level of the pupils, and other relevant details.

We have already mentioned the costs of education as a limiting factor to the development of a school system. But how is the administrator to attempt any rational costing of a school programme unless he has some estimates, however approximate, of the probable size of the school population?

So far we have only touched upon the needs of the school administrator in carrying out existing or pre-determined school policies. Where a country is faced with the possibility or necessity of changes in its school policies, the need for estimating future school enrolment under various assumptions is even more obvious. In fact, the feasibility of certain changes may have to be tested first by evaluating their possible effects on the size of the future school enrolment. For example, before introducing a new law or changing an existing one on compulsory education, it would be only prudent and reasonable to find out what would be the probable size of the educational task under such a new law or amendment. This would require first an estimate or a series of alternative estimates of the potential school enrolment, depending on the type of contemplated change.

Other instances of this kind may arise in connexion with the education of girls, i.e., whether they are to be taught in separate schools or admitted to the same schools with boys, or in connexion with the establishment or expansion of schools in rural or in urban areas. Since the number of girls in the

population of school age is more or less equal to the number of boys, and since the percentage of rural population in a developing country is likely to be higher than the percentage of urban population, it may be easily seen that any change in policy regarding the education of girls or the establishment of schools in rural areas must affect the total school enrolment appreciably.

Still other questions of school policy may have to do with the requirements for admission, attendance, promotion and graduation of pupils at different levels of schooling. Where there is serious wastage due to large numbers of pupils who drop out of school before completion or who repeat their grades due to non-promotion, changes in policy regarding drop-outs and repeaters could influence the size of school enrolment in one way or another.

These are some of the ways in which estimates of future school enrolment can help the school administrator or policy-maker in shaping the educational development of a country. Depending on the particular needs of the school administrator or educational planner, school enrolment may have to be estimated for a time period ranging from one year to twenty years or more. We shall now consider some of the elements involved in short-term, medium-term and long-term estimates of future school enrolment, especially for purposes of school administration and educational planning in a developing country.

3. SHORT-TERM, MEDIUM-TERM AND LONG-TERM ESTIMATES

Once it is decided that estimates of future school enrolment are needed, what is a desirable period of time for which such estimates should be made? The answer, of course, depends in part on the use to be made of the estimates. If enrolment estimates are needed for the sole purpose of preparing an annual budget of expenditures for the school system, it is probably enough to make annual estimates of enrolment one or two years in advance. If a school building programme is under consideration which would be spread over a period of a few years, then estimates of school enrolment must be prepared for several years ahead. If the question under consideration has to do with the training of teachers and related professional workers, then the period of time covered by the estimates must be at least as long as it takes to complete the training of one group of such workers. If, however, it is a question of reorganizing an entire school system, involving every level and type of education, it would seem advisable to draw up estimates of future enrolment for at least ten to fifteen years – about the length of time it takes for a pupil to progress through the school system. Finally, for the establishment or

changing of basic educational policies, it may be necessary to evaluate such policies in terms of their probable effects on school enrolment for twenty years or more – the span of a whole generation of children through their formative years of adolescence and youth.

The length of time to be covered by enrolment estimates is also related to the amount and recency of basic data available to the estimator. If, for example, we have full, reliable, and up-to-date figures on births, deaths, and migration of the population over a long stretch of years, as well as data on school enrolment and attendance by sex, age and grade of pupils from census enumerations and school records for an equally long period, it would not be very difficult to attempt relatively long-term estimates of future school enrolment for the students who will be graduating from universities twenty years hence, or those who will be completing their secondary education fifteen years from now, or even most of the children coming out of the primary schools in the next ten to fifteen years are already born. In other words, we need estimated numbers of births for only a few years ahead in order to have a basic population from which to derive some estimates of future enrolment in primary schools up to ten years, in secondary schools up to fifteen years, and in higher education up to twenty years. To the extent that our basic data are incomplete or out of date, we must of course resort to making various adjustments and assumptions, whose validity may become questionable even over a relatively short period of time.

Keeping in mind that all estimates of future school enrolment, whatever the length of their coverage, are subject to varying degrees of error, we should be less concerned with the choice between long-term and short-term estimates and more concerned with the quality and adequacy of our basic data. Within the limits of our data, and by judicious use of reasonable assumptions, we may be able to prepare fairly long-term estimates as satisfactorily as those of short-term. As a matter of fact, most of the school enrolment estimates published in recent years have tended to cover periods of time ranging from ten to fifteen years – which might be called medium-term estimates. For a developing country, with the usual problems of deficient data and uncertain trends, it might be prudent for the technician to begin with estimates over a shorter period of time. With more experience and better data at hand, longer-term estimates could be attempted.

One important safeguard of a long-term estimation of future enrolment should be a built-in feature of frequent revisions, so as to reduce the margin of error by modifying the original assumptions in the light of later observations. This procedure is generally followed in work of this kind done in the more developed countries.