

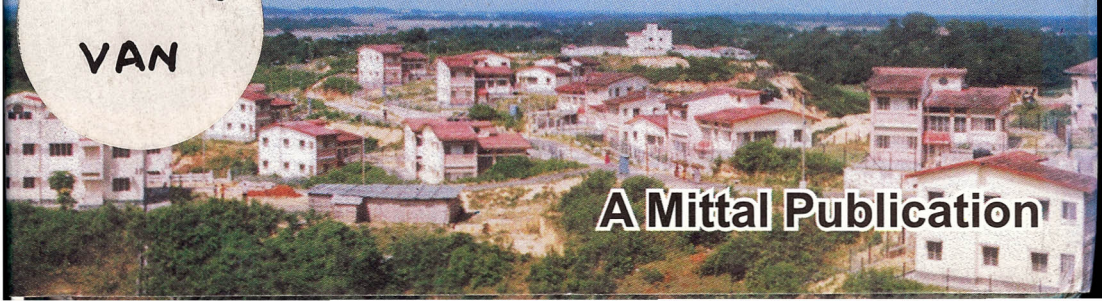


Vanlalchhawna

Higher Education in North-East India

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A Mittal Publication

**HIGHER EDUCATION
IN NORTH-EAST INDIA**

THE AUTHOR

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HIGHER
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IN
NORTH-EAST
INDIA
—Unit Cost Analysis

Vanlalchhawna



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**Dedicated to
My Parents,
wife
and
my children**



FOREWORD

Over the period of previous half a century, there has been a fierce debate on the diverse issues connected with human rights. The struggle for civil rights, which sought to establish the notion of legal equality of the members of human race, commenced in and dominated the period of 17th and 18th centuries. The 19th century and the early part of the 20th century saw the domination of political rights in the human rights discourse. However, as has become abundantly clear, neither the legal equality enshrined in the idea of civil rights, nor the exercise of political rights in an enlightened way would be possible unless the citizens' social rights are first acknowledged and secured. The term social rights may be thought to refer to the right to the social heritage and standard of life of society. Education, housing, social security and employment form the chief ingredients of the social rights construct.

The quality of education would ultimately determine the quality of human life in society, whether at material or non-material planes. The quality which it might be possible to impart to the educational endeavors of society will in a considerable measure depend upon the volume of investment in education. And since there are competing claims on the resources of a country, the notion of cost inevitably enters into the picture. In the present book, Vanlalchhawna, focuses on the question of cost of education, specifically the higher education.

The book is an enlargement of a painstaking doctoral work of Vanlalchhawna. The initial focus of doctoral research was on the college education sector in state of Mizoram; the original work underwent revisions *inter-alia* to incorporate secondary data that would allow the author to present a more generic account. Those revisions, the author has been able

to accomplish with some dexterity; in its present form, the book allows the reader access to an analysis which encompasses the entire North-Eastern region. Admittedly, the primary data pertain to the state of Mizoram alone, but these could be extrapolated to build the broader picture notwithstanding that there would be an element of inter-state variations. This would need to be accounted for. Those variations, more likely than not, would be of a marginal nature.

Vital clues emerge for the policy-makers from Dr. Vanlalchhawna's analysis. The author recommends that the opening of new colleges should be linked to their academic and economic viability. And, to address the ethical questions of access and equity, subsidies for students from educationally backward areas and low-income groups are suggested. Similarly, in cognizance of the fact that there are substantial subsidies in higher education by the state governments from which the rich benefit as much as the poor, the author advocates fee hikes. The well-to-do should be required to pay the higher fees which they can, anyway, afford to pay, whereas the poor students should be extended liberal subsidies to allow them access to higher education under a revised-fee regime.

There are other cues, arising from Dr. Vanlalchhawna's exploration, for the policy-makers; of these, one would find a succinct summary in chapter-7 of the book. Policy-issue knowledge, to borrow a phrase from Yezhekal Dror, should find its way into the policy-making circuit. While the inertia-ridden public systems would be slow to absorb the clues emanating from academic analysis, ministers, legislators, party-leaders and bureaucrats are nonetheless favourably disposed to independent analysis. Analysis, ultimately, provides defensibility to policy. It brings credibility to governance. For those reasons, policy-makers would never be averse to policy-analysis, although there would be a time-lag between when an analysis was completed and when its conclusions would be incorporated in the policy-formulation exercise.

In its own way, Dr. Vanlalchhawna's is a pioneering work; it should, I hope, inspire further research in this and other related domains. I compliment the author for a well-done job.

The first two chapters add to the scholastic weight of the book. The next four carry valuable insights for the educational planners and administrators. I yet again congratulate the author for this commendable effort.

ARVIND K. SHARMA,
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Mizoram University

ACKNOWLEDGEMENT

Higher education plays a crucial role in national development and socio-economic transformation of the society. It is an essential input for the formation of skilled manpower which is needed in crucial sectors of national development. Since it provides upward mobility and access to higher levels of economic activities for the weaker sections of the society, higher education is also a critical element to ensure social justice and equity. Recently, higher education in India suffers deep financial crisis as allocation of public fund to the sector has been reduced gradually while fees and other charges could not be raised due to socio-political constraints. Thus, the issue of efficient use of resources can no longer be ignored in the functioning of higher education system. Educational cost analysis provides a powerful tool in the hands of the educational planners and decision-makers to evaluate the working of educational institutions in terms of resource allocation and productivity. Higher educational institutions, in particular collegiate education, are growing rapidly in the North Eastern Region of India in recent years. This study has made an attempt to examine the pattern of unit costs of these institutions, based on colleges for general education in Mizoram, one of the constituent states of the region. Unit cost analysis has been attempted at the institutional and household level.

The book is a slightly modified and updated version of my doctoral dissertation submitted to North Eastern Hill University (NEHU), Shillong, Meghalaya; and completed under the supervision of Professor T. Lawma, Department of Economics, NEHU (Mizoram Campus), presently Pro-Vice Chancellor, Mizoram University. I am indeed thankful to him for his guidance, supervision and constant encouragement during the course of the works. The study would not have been

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I am greatly indebted to all the principals and staff of the colleges selected for intensive study for their help and cooperation during data collection and for making all the necessary information and documents available and accessible to me. I put on record my deep appreciation to Statistical Wing, Directorate of School Education which provided me with a lot of important materials for this research work. I owe a great deal to my colleagues, friends and well-wishers who gave me their support and favour generously. Lastly, I express my gratitude to my family who had to bear all the hardships during the entire period of study.

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INTRODUCTION

Economic development is a complex process involving a number of factors such as physical, financial and human resources. Conventional economic analysis on capital and investment theory usually concentrated on investment in physical capital assets such as machines, tools, factories and buildings as strategic inputs for economic growth and development. It was contented that the dynamics of economic growth and fluctuation in output and income could largely be explained and analysed in terms of change and movement in the level of investment in these physical capital assets. However, since the middle of 1950s, studies on economic growth in advanced countries revealed the important role played by non-material investment especially human resource. It was found that the growth of capital stock was of relatively minor importance in accounting for the growth of total output (Abromovitz, 1956; Solow, 1957). It was further realised that investment in human resource was a critical factor in the development process of a nation and that investment in human beings had been the major source of economic growth in advanced countries. (Shultz, 1960, 1961; Becker, 1960, 1975; Dennison, 1962).

Human capital implies skills, capacities and abilities possessed by an individual which enable him to earn an income (Bannock, *et al.*, 1981). It is now universally recognised as the most fundamental of all economic resources. Prof. Frederick Harbison (1973) rightly observed the role of human capital in the following words : "Human resources, not capital, nor income, nor material resources,

constitute the ultimate basis for wealth of nations. Capital and natural resources are passive factors of production; human beings are the active agents who accumulate capital, exploit natural resources, build social, economic and political organisation; and carry forward national development. Clearly a country which is unable to develop the skills and knowledge of its people and to utilize them effectively in the national economy will be unable to develop anything else" (p.3).

T.W.Shultz (1902-1998) was a pioneer in analysing economic process leading to human capital formation and its impact on economic growth and development. Shultz (1961) who introduced the theory of human capital argued that both knowledge and skill are a form of capital and that this capital is a product of "deliberate investment". He compared the acquisition of knowledge and skills to acquiring the "the means of production" and asserted that difference in earnings between people related to the differences in access to education and health. According to Shultz (1981), investment in people and knowledge is the key to development of a nation and securing human welfare. He observed that the acquired abilities of people—their education, experiences, skills and health constitute the most important economic resource in the world. It is human capital and investment in population quality which hold the key to future economic productivity and prosperity.

Human capital is basically formed by education and training. The formation of human capital by education has numerous peculiar characteristics quite distinct from those of physical capital formation such as factories, buildings, machineries and other financial assets. These attributes, as specified by Shultz (1987) consist of the following elements :

- (i) An individual's stock of human capital cannot be sold, nor can it be given to someone else. It goes with the individual whenever he or she may go.
- (ii) To take advantage of human capital, an individual must do it in person.
- (iii) The duration of the value of an individual's human capital cannot exceed his or her life span.
- (iv) In acquiring human capital, an individual must invest some of his or her own time along with other resources.
- (v) It is efficient to invest in human capital during

the period of youth because the value of time is less than it is when the individual grows older and because there will be a greater number of years in which to benefit from the acquired human capital. (vi) Human capital depreciates over time as does physical capital. Some forms become obsolete in a short time because of changing circumstances. Other forms have a long life even as circumstances change. (vii) Women, for good reasons, invest in somewhat different forms of human capital than men. In short, human capital is a part of the individual—it cannot be sold, mortgaged or transferred.

The economic value of education had long been recognised since the time of classical economists. Classical economists like Adam Smith (1723-1790), Alfred Marshall (1842-1924) and John Stuart Mill (1808-1873) emphasised the importance of education as a form of national investment, and considered the question how education should be financed. Adam Smith (1776) pointed out that "a man educated at the expense of much labour and time..... may be compared to expensive machines". Other classical economists also observed that expenditure on education could be regarded as a form of investment that promised future benefits. Alfred Marshall (1890) regarded expenditure on education as 'national investment' and in his view, 'the most valuable of all capital is that invested in human beings.' Russian economists, Strumillin (1924) also examined the economic significance of education in the Soviet Union in the early parts of the twentieth century.

The revival of interest in the concept of investment in human capital in the advanced countries especially in U.S.A. and U.K since the mid-1950s stimulated several empirical studies into the relation between education and the economy. There was tremendous growth of research works in the area of human capital formation especially through education and training. Bowman (1966) rightly described it as, "the human investment revolution in economic thought". The pioneering works in the field of investment in human capital were contributed by T.W. Shultz (1960, 1961), Walsh (1935), Jacob Mincer (1958), Gary S. Becker (1962, 1975), E.F. Denison (1962) and Friedman and Kuznets (1946). These economists

and others analysed the concept of human capital treating education and training as a form of investment producing future benefits in the form of higher income for both educated individuals and for society as a whole. They also stressed the catalytic role of education in the process of technical transformation, socio-economic development and industrialisation in the advanced countries.

Denison (1962) observed that education contributes to growth of output and income at least in two distinct ways: first, it raises the quality and correspondingly the productivity of the labour force; secondly, education accelerates the rate at which society's stock of knowledge itself advances. According to Prakash (1996), education performs the following functions in modern economy : (i) Education acts as a catalyst of socio-economic change by generating appropriate attitudes and growth environment. It furnishes information and knowledge base, rational thought, attitude and value to change the irrelevant and obsolete and to pave the way for the establishment of new order. (ii) Education leads to greater degree of equalisation in the distribution of income and wealth through equalisation of opportunities. Investment in education tends to facilitate the vertical and upward movement of people belonging to lower income occupation and social groups. (iii) Education supplies qualified manpower to meet the human capital requirements of the economy. (iv) Education generates intermediate and final demand for the output of other sectors which it uses as flow and stock input directly and indirectly in its production process. (v) Education generates employment directly and indirectly. (vi) Education leads to improvements in individual hygiene and public sanitation, family planning, nutrition, health and shelter.

Since the mid-1950s, economists have attempted different approaches to examine and quantify the contribution of investment in education on the growth of output and income in the economy. Following Bowen (1964), these studies may be classified into four main groups : (i) the simple correlation approach; (ii) the residual approach; (iii) the returns to education approach; and (iv) the manpower planning approach.

(i) *The Simple Correlation Approach* : This approach examines the quantitative relationship between indicators of educational development and economic growth for a country. Svenilsson, *et al.*, (1962) found a positive relationship between enrolment ratios and GNP per capita in a cross-section analysis of 22 European countries. Anderson and Bowmen (1963) also found that primary schooling and literacy were more correlated highly with level of economic development than the provision of secondary or tertiary education. Harbison and Myers (1964) in a study covering 75 countries worked out a composite index of human resource development on the basis of educational indicators, gross national product and percentage of population engaged in agriculture. According to them, the stock of human capital and its rate of formations were the most important indicators of human resource development of a country. On examination of the pattern of relationship between human resource development and stage of economic growth, they observed a close association between enrolment ratios at all levels of education and GNP per capita. McClelland (1966) who studied the hypothesis that high educational attainment accelerates economic growth taking electricity consumption as an index of development came to the conclusion that countries with relatively higher levels of education embodied in the population developed at a higher rate. Lockheed (1987) found that education had positive impacts on farmers' efficiency in developing countries. He observed that education has a higher payoff for farmers in a changing modernizing environment than in a static traditional ones. In a cross-country study of a sample of 75 developing countries during the period between 1960 and 1977, Hicks (1987) observed that the rapidly growing developing countries were those that had above average performance in both literacy and life expectancy. He also found a strong correlation between literacy levels and life expectancy.

In Indian context, the important works done by Mukherji and Rao (1967), Choudhari (1969) and Ansari (1987, 1993) may be mentioned. Mukherji and Rao (1967), who examined the relationship between investment in education and economic growth in India, observed that only higher technical

education could be considered as economic investment while other forms of expenditure might better be considered as consumption expenditure. Chaudhari (1969) also found an associative relationship between education of farm workers and level of agriculture productivity. In his study on the relationship between education and productivity in Indian agriculture, he obtained a positive relationship between literacy and yield per worker, literacy and yield per acre, primary education and yield per worker and primary education and yield per acre. Ansari (1987, 1993) observed that neglect of education, which was assessed in term of resource allocation, had impeded economic growth in the country. Due to low level of educational development, as measured by the level of literacy, the growth of Gross National Product (GNP) over the past decades of planning had been tardy and increased only at the rate of 3.5 per cent per annum. The coefficient of correlation between literacy and per capita income across the states was positive and highly significant. The coefficient also indicated that in the states where there were more illiterates, the intensity of poverty was also high.

(ii) *The Residual Approach* : It is a widely held view that education contributes significantly to the growth of output and income in the economy. The residual approach examines the increase in total national income of an economy over a given period of time and identifies as much of the total increases as possible with measurable inputs such as capital and labour and concludes that the residual is attributable to the unspecified inputs. Among the unspecified inputs, education and advances in knowledge are the most important. The names associated with this approach are Abromovitz (1957), Solow (1957), Kendrick (1961), Dennison (1962) and Shultz (1961). Abromovitz (1956) observed that between 80 and 90 per cent of the growth of output per head in the US economy over the century could not be accounted by the increase in capital per head. Abramovitz designated the heterogeneous elements that made up of residuals as 'a measure of our ignorance'. Under the assumption of linear homogenous production and neutral technical change, Solow (1957) computed a 'residual' equal to 90 per cent of the increase in output per man hour in the US between 1919 and 1957.

Kendrick (1961) also found that, over the period between 1889 and 1957, the combined input index for the US economy increased at an average rate of 1.9 per cent per annum and the output index increased at about 3.5 per cent per annum, leaving a 'residual' increase of 1.6 per cent. Thus 46 per cent of the increase in total output could be ascribed to the residual. Dennison (1962) found that 23 per cent of the growth of national and 42 per cent of growth of per capita income in the US economy from 1929 to 1957 had been accounted by education which constituted a part of the residual. Shultz (1961) estimated that 60 per cent as a measure of 'unexplained' growth in the US economy between 1929 and 1956, and between 30 and 50 per cent of this residual could be taken as representing a return to the increased education of the labour force.

Dholakia (1974) made an attempt to quantify the contribution of education to economic growth in India. He came to the conclusion that the quality index of the labour force in India during 1948-49 to 1968-69 increased only by 7.5 per cent. This was because of the small base for which the educational development started, so that even a rapid growth in it after the inception of planning in India had a very small overall effect. Prakash and Buragohain (1993) who furnished empirical estimates of the economic value of education in India have shown that the growth of national income accounted by education increased from 3 per cent in 1961 to approximately 4 per cent in 1979.

(iii) *The Returns to Education Approach* : Since education sector absorbs a large amount of public and private resources, it is natural to enquire the rates of return from educational expenditure. The returns to education may be monetary or non-monetary and private as well as social. Generally, direct monetary benefits are taken into account in the calculation of rates of return to education. Becker (1975) found that average money rates of return to education decreased as the level of education increased and college graduate earned more than high school graduates mainly because of their additional education. Becker, in his examination of the economics of on-the-job training, found that

under perfect competition, it was the workers rather than the employers that paid the cost of certain kinds of training. Miller (1960) calculated the lifetime income values by level of schooling. Houthakker (1959) estimated, on the basis of alternative discount rates, the present value income streams associated with different levels of schooling. Hansen (1968) also provided the estimate of the rates of return to investment in schooling in the United States. Psacharopoulos (1981) summarised the rates of return to education calculated for the developed and developing countries as follows: (a) returns to primary school are higher than those of other levels of education; (b) private returns exceed social returns, particularly at the university level; (c) all rates of return are above 10 per cent; (d) returns to education were higher in the poorer countries, reflecting the greater scarcities of trained manpower in these countries.

A good number of studies relating to Indian data had been undertaken by several economists such as Nalla Gounden (1965), Mark Blaug, *et al.*, (1969), Kothari (1967), Pandit (1972), Hussain (1967), Panchamukhi (1969), Chaudhari and Rao (1970), Chaudhari (1979) and Tilak (1987). From these studies, a few general conclusions may be drawn as follows: (a) the returns to primary education are very high; (b) the returns to high school education are fairly good; (c) the returns to college education are low compared to school education; (d) professional education carries with it higher rates of returns than general education; (e) investment in education in India is not as profitable as investment in physical capital.

(iv) Manpower Planning Approach to Education: This approach tries to give a rough estimate of the future requirements of educated and skilled manpower of an economy for different productive sectors. Modern economies require a wide range of human skills and knowledge to generate the dynamics of development. In fact, it is impossible to utilize efficiently many of the complex forms of modern physical capital in the absence of a relatively high level of human skills. A country must plan in advance to have a group of scientists, technicians, administrative and managerial

personnel in order to benefit fully from the new productive assets that emerge from the advance in science and technology. The development of qualified manpower is the basic objective of manpower planning approach to education. Some of the techniques and methods adopted for projecting manpower requirements include : (i) estimation on the basis of the employer's opinion about their future manpower requirements, (ii) extrapolation of the past employment trends into the future (Harbison and Myers, 1974), (iii) inter-country comparisons (OECD, 1962), (iv) on the basis of development plan and projects, and (v) on the basis of productivity of labour and future output (Parnes, 1964). Manpower planning approach to education adopted an input-output econometric model of educational system. This method is based on the assumption of the existence of a homogeneous production function in the economy and also the operation of both constant returns to scale and diminishing returns. The pioneering works in this field had been done by Correa-Tinbergen-Bos (1964), Layard and Saigal (1966), Stone (1966) while the models for India were associated with Burgess, Layard and Pant (1968) Ramanujan (1969), Shri Prakash (1971, 1977) Prakash and Radhakrishnan (1973) and Lawma (1990).

Correa-Tinbergen-Bos (1964) examined the balanced growth path of education. This model determined the equilibrium growth of manpower at different levels of education such as primary, secondary and university levels. This model viewed educational planning from the point of view of demand and recognised at the same time the self-contained nature of the education sector. Layard and Saigal (1966), in a study of international manpower comparison, attempted to depict the single manpower growth path for all countries. The study concluded that there was a tendency for the educational levels of occupations to rise with output per worker. Stone (1965) developed an inter-temporal, multi-sectoral input-output model of education. He defined educational system as a chain of inter-dependent processes and his model was analogous to open dynamic input-output model where the number of students enrolled in a given year were shown as functions of future vectors of graduate leavers. He designed an input-

output accounting matrix with the number of students as inputs and graduates leaving the education system as output. He also made allowances for wastages, drop-outs and technological changes.

Burgess, Layard and Pant (1968) defined the structure of employment in India by levels of education and industry on the basis of 1961 census and had made an attempt to estimate the manpower requirements of various categories of higher level by making several important assumptions about the sectoral growth rates. Ramanujan (1969) estimated the occupation-educated manpower requirements of India for 1970-71, 1975-76 and 1980-81 using the input-output data for the Indian economy. Shri Prakash (1977) who developed an input-output model for educational planning in India dealt with the methods of estimating the manpower requirements based on a given rate and a pattern of future economic growth; thus determining the supply of manpower with different levels and types of education. In another study, Prakash (1971) projected the occupation-educational structure of manpower for two public sector industries in India. Again, Prakash and Radhakrishnan (1973) attempted to estimate the private demand for education and found that the demand for education is a function of a number of factors such as, socio-economic, cultural, demographic and educational factors. The influence of parents' income and occupation in demand for education is much higher at the higher level and type of education.

Lawma (1990) analysed the problem of upgrading and downgrading of educational qualifications at the conceptual, methodological and empirical levels. He made an attempt to measure the nature, degree and direction of divergencies between the desired and the actual levels and patterns of educational qualifications in different sectors of the economy and the occupations within them. He established that the labour market even in an underdeveloped and isolated region like North East India is neither local nor segmented in nature, as a substantial proportion of manpower was imported from the rest of the country in order to meet shortages in local supply. He also succeeded in establishing the patterns of inter

and intra-regional migration by the levels and types of education, occupation and various sectors of the economy which highlighted the role of migration as a balancing factor in the regional labour markets. Other findings of the study were: (a) formal qualifications are more important for job entry in the general education based jobs; (b) practical training and work experience are more important for job entry in the general education based jobs; (c) in professional/technical based jobs, experience is more important for vertical mobility; (d) the possibilities of upgradation of qualifications are more in general education based jobs.

Scope and Objectives of the Study

The recognition of the economic value of education and its role in the development process of a nation had inspired developing countries to invest considerable amount of their scarce resources to education. India, like many other developing countries, also invested a good amount of public resources to educational sector under its successive Five Year Plans which have resulted to a significant expansion of the country's educational system from primary to university level. Access to educational facilities, earlier restricted to a few sections of Indian society, is now opened to a vast majority of the population. Today, India has one of the largest elementary education system in the world. About 94 per cent of rural population has access to primary schooling facilities within a walking distance of 1 km. and 84 per cent of the population is served by middle schools within a distance of 3 kms. Higher education, vital for national economy, also witnessed a steady growth since independence. Besides enrolment, institutions and teachers, the quantum of public investment on higher education had increased significantly. However, since the mid-1970s, the system has been adversely affected by deep financial crisis due primarily to shrinking budgetary resources both at the centre and state level. Expenditure on higher education as percentage of GNP increased by five-fold from 0.19 per cent in 1950-51 to 0.98 in 1980-81. But ever since, allocation of resources has been steadily coming down. By mid-1990s, it has tended to fall to 0.39 per cent of GNP. The share of higher education in total

planned resources was 0.71 per cent in the first Five Year Plan (1951-56) which increased to 1.24 per cent in the fourth Five Year Plan (1969-74). But the share has been gradually falling, reaching as low as 0.35 per cent in the eighth Five Year Plan (1992-97). Similarly, the share of higher education in total educational outlay increased from 9 per cent in the first Five Year Plan to an all time peak of 25 per cent in the fourth Five Year Plan. The share has been consistently declining; and it was only 8 per cent in the eighth Five Year Plan. Inflation has also had an adverse impact on education. While the expenditure on higher education increased more than 100 times in nominal terms from Rs 140 million in the first Five Year Plan to Rs 15,000 million in the eighth Five Year Plan, the increase was only 6.5 times in terms of real prices (INCCU, 1998). Meanwhile, the demand for higher education increases tremendously due to population growth, urbanisation, technological change and improvement in standard of living. It may be noted that resources available for higher education are far from adequate and total public investment is still regarded as much below the optimum. In order to meet the increasing demand for higher education with available limited resources at the disposal of public authority, educational planners and policy-makers need to work out definite plan of actions to improve the efficiency of the system. This could be achieved by reducing the costs of education for a given level of output or increasing the productivity of given inputs. Unit cost analysis of education is the first step in achieving these objectives.

Since the early 1960s, estimates of unit cost of education have been one of the most important areas of empirical research and analysis. It was realised that educational cost analysis could serve a powerful tool in the hands of policy-makers and planners in designing better methods for managing educational costs. Educational cost analysis has also attracted the attention of researchers and policy makers in India. Quite a few studies at the national, state and micro-level have been done in the country by individual researchers and commissions/committees. To the best of our knowledge, no empirical study has ever been done on this issue in the

North Eastern Region of India. The present study is a modest attempt to analyse the cost of higher education in Mizoram which is one of the constituent states of the Region. Since affiliated colleges occupied a dominant position in the higher education system of the country in terms of enrolment, teachers and institutions, the present study has specifically focused on the structure of unit cost at the college level.

Mizoram has made rapid progress in the field of general education during the last five decades. Both government and households devoted substantial amount of resources to education. However, the experience of the state so far revealed that rational calculations have not played, at any stage, a decisive role in the expansion of the system and allocation of resources. Moreover, public authorities did not bother about the issues as to whether resources invested in education had been efficiently utilized or not. Since the state has been under severe fiscal constraints, the issues of efficient utilization of educational resources can no longer be ignored and undermined in the functioning of higher education. Unit cost analysis is, therefore, very crucial to understand the performance of higher education in the state. The study has been set with the following objectives : (i) to examine the growth of higher education in the North Eastern Region of India including Sikkim; (ii) to analyse the pattern and growth trend of public expenditure on education in Mizoram since 1972-73; (iii) to analyse the sources of educational finance with special reference to college education—their organisation, control and administration; (iv) to estimate unit cost of college education and to analyse the pattern and trend of unit institutional cost; (v) to study the relationship between unit cost and enrolment size; and (vi) to estimate direct private costs of college education and to assess the impact of socio-economic status of the parents on the educational expenditure of children.

The scope of the study is confined to the cost analysis of college education which comprises two-year pre-university courses and three-years integrated degree courses. Post-graduate education at the university and other post-matric education of technical and professional education like

polytechnic and teacher's training institutes have been excluded. Institutional costs did not take into account the expenditure on direction and administration incurred at the secretariat and directorate level. Since expenditures on scholarships, stipends and other financial assistance received by students from various sources were treated as transfer payments, they have not been considered for the calculation of unit cost of higher education. Opportunity costs are not estimated. The estimates of total cost of college education given in the present study, therefore, consist of direct private costs and direct institutional costs of education, net of transfer payments.

Analysis of unit cost of education has many practical significance in the field of educational planning. Education planners and policy makers can easily evaluate the internal and external efficiency of an educational institution in terms of productivity and allocation of resources on the basis of unit cost analysis. Fielden and Pearson (1978) emphasised the value of cost analysis in the following words: "In the current economic climate, resources for education and training are becoming scarcer. There will be increasing pressure from policy makers for cost reduction and increased efficiency and there is likely to be more resistance to providing extra resources for educational projects. Educational staff will therefore need even more than before, to make the best use of the resources available, to examine carefully the full resource implications of any proposed new schemes, and to support their arguments with quantitative data wherever possible. Cost analysis can be a powerful aid to achieve these aims" (p.19). Unit cost analysis, specifically serves the following purposes:

- (i) to estimate and working out resources required for educational sector and for various sub-sectors of education;
- (ii) to improve the efficiency of resources invested in education;
- (iii) to evaluate if resources allocated to education are optimally used and within educational sector whether resources are optimally allocated between different sub-system of education;
- (iv) to assess the cost-effectiveness and cost-benefit ratio of the educational system as a whole and of the different levels of the system.

Conceptual Frameworks

Educational institutions like schools, colleges and universities may be considered as the firms of education industry. Like any other industrial process, the analysis of the structure of inputs and outputs of the educational system is necessary to make rational decisions with respect to resource allocation in the field of education. However, educational industry has its own peculiar characters quite distinct from other industries such as manufacturing or agriculture or even with other serviced-based industries. In most countries, education is provided and funded by government. While educational inputs are bought from different markets, the output is not sold directly. The production cycle is much longer compared with other industries and it consumes a relatively large fraction of its own output. It is not engaged in profit-maximizing activity (Blaug 1971).

Educational institutions, like other producing units, transform inputs into outputs, incurring costs in the process. Enrolments are generally taken as the output of education in order to estimate unit cost of education. Students enter into educational institutions as the raw-material to be processed, and are transmitted from lower to higher stages as goods in process. The output of education may be said to be the "knowledge added" or "educational value added" which consists of the knowledge absorbed and capabilities developed by the students at each stage of their education. Total enrolment is taken as gross output and the number of passed-out or graduates can be regarded as net output (Prakash, 1996).

The inputs of the educational plant which enter into the educational production function consist of both human and physical Human inputs include the services of teachers and other non-teaching staff, input of students' time and services as raw materials whereas physical inputs indicate the services of such material goods as books, stationery, uniforms, buildings, laboratory items and other equipments. Evaluation of the cost of these factor services formed the basis of educational cost analysis. The factor cost of education is the sum total of expenditure paid for different factor inputs used in the educational production function such as teachers, auxiliary

staff, building, equipment, furniture, books and stationery. The services of these factor inputs are purchased from different markets. The size of the markets of individual input may spread from purely local to international and their structures may be approximated from pure competition to near perfect monopoly. Most of the markets are, in fact, highly specialised oligopolistic markets with highly differentiated products (Prakash 1996). The education institutions which buy the factor services have to pay fixed prices set by the public authority in case of academic and non-academic staff while the services of other physical inputs are purchased at the prices prevailing in the market. In planned economies, prices are fixed by government while in the market economies prices are the result of the interplay of the forces of demand and supply.

The factor cost of education may be classified into a number of ways. Generally, educational costs are categorised into three major components. These are : (i) institutional cost, (ii) private or student cost, and (iii) opportunity cost. Institutional cost represents the cost incurred by the government or educational institution or both in operating and maintaining the institution to provide facilities of education. Private cost of education is that part of investment in education which is made either by the student or his/her parents or both. Opportunity cost is the earnings forgone by a student on account of pursuing a given level of education or the benefits forgone that would have been available to the society in the absence of educational programme. Institutional cost is usually classified into recurring and non-recurring costs or current and capital costs. Sometimes, it may also be classified into variable and fixed costs of education. The fixed costs or capital costs or non-recurring costs mean the purchase of durable assets which are expected to yield benefits over a longer period while recurring or current or variable costs include all expenditure on consumable goods and services which bring immediate or short term benefits and have to be regularly renewed (Woodhall, 1987). Recurring costs may be divided into two parts-divisible and non-divisible. Some of the components of recurring costs are divisible in the sense that these costs are incurred in providing services to a group or part of the student body e.g., salaries and allowances of teachers and current

expenditure on consumable stores for laboratory. Non-divisible costs comprise those items of expenditure which are incurred for providing common services to all students in the institutions and cannot be assigned to any category of students or course. These items include salaries of non-teaching staff, common services and other recurring costs excluding current laboratory expenses and costs of student activities.

Private cost of education is broadly divided into direct and indirect cost. Direct private cost is defined as the cost directly incurred by a household for the education of students. Direct cost has two components: academic costs and non-academic costs. Academic costs indicate expenditure directly related with the education of the student, whereas non-academic costs refer to the supports and maintenance of the student during their studies. The major component of academic costs are fees given to the colleges, cost of books and stationery. Fees consist of tuition fee and other fees directly given to the colleges. Cost of books and stationery items include the expenditure incurred by the students and their families on textbooks, magazines, daily newspapers, exercise books, papers, pen, tools and instruments. Non-academic costs refer to expenditure on food, transport and communication and personal maintenance. Expenditure on food constitutes an important component of private cost of education. In this respect, students are divided into hostellers and day-scholars. The day scholars are of two types: those who stay with their parents and those who make their own arrangement outside hostel. The expenditure on food and lodging of these two categories will not be same. While the expenditure of the hostellers can easily be estimated, it is not easy for those of day-scholars. The expenditure on food and lodging may vary considerably according to individual tastes and habits and more importantly, the economic status of the students or his parents. Transport and communication expenses include the amount of expenditure incurred by the students for their journey to and from the place of study, daily transport for going to the colleges, postages and other related items. Expenditure on personal maintenance incurred by the student includes items on clothing, footwear, medicines and medical check-up and other consumables like soap, toothpastes and toiletries.

Indirect costs or opportunity costs of education represent earnings foregone by students and imputed rent of lands, buildings and other durable assets owned by educational institutions. There is some controversy relating to the inclusions of opportunity costs in the estimates of total cost of education. Blaug (1970) argued that earnings foregone should be included in any estimate of the true cost of education but Vaizey (1972) rejected this view. However, quite a few economists have attempted to measure the opportunity cost in their study on cost-benefit analysis in education and for assessing the total resource cost of education. (Shultz, 1961, Blaug, et.al 1969, Becker, 1975, OECD, 1977, Tilak 1987). To estimate opportunity cost of education, it is necessary to calculate the imputed rental value of educational capital and the forgone earnings by students. The age-education-earnings profiles which represent the earnings at each age of people with various levels of education may be used to measure foregone earnings of student. For instance, the earnings foregone by undergraduates can be obtained from the age-earnings of matriculate. The earnings forgone by any group of students can be estimated from the earnings of those who have completed the previous level of education (Blaug, et.al 1969). Since the kind of data which can be used or generated to estimate opportunity cost of education is not available in Mizoram, no attempt has been made to analyse and estimate opportunity cost of higher education.

Methodology and Sources of Data

The sample design of the study involved two stages—the selection of colleges and the selection of the students. At the time of collection of data in 1993-94, there were 29 colleges in Mizoram all affiliated to North Eastern Hill University (NEHU); thirteen of them were general degree colleges whereas the remaining 16 colleges were either recognised or affiliated upto Pre-University level. All the degree colleges for general education were selected to represent the sample of the analysis; however, data could be obtained only from 10 colleges. Hence, the present study is based on data collected from ten general degree colleges in Mizoram. Their profiles are given in Table 1.1.

Table 1.1 : Degree Colleges included in the Study

Sf. No	Name of the College	Year of Establishment	Enrolment 1993	No. of Teachers	Nature of the college (Numbers of courses offered)
A.	University College				
1.	P U College	1958	1354	75	Arts, Science, Commerce.
B	State Government Colleges				
2.	Aizawl College	1975	1749	46	Arts, Science, Commerce.
3.	Zirtiri Women's College	1980	419	21	Arts, Home Science
4.	Champhai College	1971	714	25	Arts,
5.	Lunglei College	1963	740	32	Arts, Science
6.	Saiha College	1978	828	28	Arts, Science
C.	Private Colleges (under grant-in-aid system)				
7.	Hrangbana College	1980	1355	40	Arts, Commerce.
8.	Hnahthial College	1979	222	15	Arts
9.	J.B.College	1983	688	9	Arts
10.	Lawngtlai College	1980	547	13	Arts
D	Total	-	8616	304	-

The sample colleges consisted of one university college, five state government colleges and four private colleges. Four colleges offered only Arts course while other three colleges serviced both Arts and Science courses. There was one college offering Arts and Commerce course upto degree level. Only two colleges had Arts, Science and Commerce course upto degree level. These colleges taken together enrolled 8616 students i.e., 53.66 per cent of the total enrolment in all colleges in Mizoram. In the sample survey for the students, stratified random sampling technique was adopted. Students were stratified according to their respective classes and their sample were randomly drawn from each class. Five per cent of the students from each class had been selected to represent the population who were administered the questionnaire specifically prepared for them. However, the actual sample turned out to be four per cent of the student enrolled in each class after excluding incomplete and no response of the sample. The total number of students in the sample was 351 students. The class-wise distribution is given in Table 1.2.

Sl. No.	Classes	Number of Students in the sample
1.	Pre University (Arts)	155
2.	Pre-University (Science)	37
3.	Pre-University (Commerce)	27
4.	B.A	100
5.	B.Sc	19
6.	B.Com	13
Total		351

As there is no secondary data available to estimate either institutional cost or private cost except tuition fee and other fees paid to the college, most of the required information were collected from primary sources. For this purpose, questionnaires were developed which had been administered to the sample populations. All the colleges included in the study were visited; information and data relating to the institutions were collected with the help of the college authorities. Students, randomly selected from each class, were guided and helped in filling up the questionnaire. The data collected in this way formed the basis of the estimates of unit cost of higher education in Mizoram. Three types of questionnaires were constructed and used for data collection.

(i) *State level questionnaire* : This questionnaire was designed to collect data and information from primary sources like the Directorate of Higher and Technical Education and Directorate of School Education and other concerned offices. State level data on enrolment, financial expenditure on recurring and non-recurring items were collected through this questionnaire.

(ii) *Institutional level questionnaire* : This questionnaire was used to collect information on institutional cost and other related materials needed for the estimation of unit costs. This schedule contained information about the number of teaching and non-teaching staff, enrolments, university examination results and financial expenditure on recurring and non-recurring items like salaries and allowances of teaching and non-teaching staff, games and sports, office expenditure, buildings, library books, other durable goods like furniture and

equipment and fund received from various sources like government, fees and other donations from individuals.

(iii) *Questionnaire for students* : A separate schedule was used to collect information on different components of private costs and the socio-economic status of the parents of the students. The schedule covered the following aspects: (1) student background- family size, income and occupation of the parents, (2) monthly average expenditure on food and rent paid to the hostel and other accommodations, (3) annual average expenditure on transport and communication, (4) expenditure on textbooks and stationery, (5) annual expenditure on clothing and other personal expenditure on toilet items, and (6) expenditure on private tuition. Those items given on a monthly basis were adjusted per year at the tabulation level and the overall expenditure is aggregated and expressed as cost per student per year.

(iv) *Other sources of data* : In addition to the data and information collected with the help of questionnaires, data were also collected from published and unpublished sources of government departments like Directorate of Economics and Statistics, Planning and Programme Implementation Department, Budget Documents from the Government of Mizoram, Ministry of Education (Government of India) and North Eastern Council (Shillong).

The growth of institutional cost was examined for the period between 1983-84 and 1993-94. The pattern and structure of unit institutional cost was estimated separately by type of management and by the number of courses serviced in the college, i.e., course-wise. The estimates of private cost were related to the academic year 1993-94. Unit institutional cost was defined as total institutional costs i.e., the sum of the annual expenditure on recurring and non-recurring items, divided by number of enrolment. Under recurring costs, the following components are considered: (i) *Teaching Costs* : Teachers are the basic input of the educational system. Teaching cost implies the expenditure incurred on the salaries and allowances of teachers employed in the college. Although principals of the colleges do not take regular classes, they are considered as members of the teaching staff in the

calculation of teaching costs. *(ii) Non-Teaching Staff Costs* : Non-teaching staff constitutes an auxiliary input of educational production system. Wages and salaries of non-teaching staff are treated as an item of recurring expenditure or cost. Non-teaching staff include staff engaged in the general administration of the college, finance/account staff, laboratories, library staff etc. *(iii) Common Services and Other Recurring Costs* : The costs under these items include expenditure on consumable items for laboratories, current expenditure on maintenance and repairs of buildings, equipment and furniture, rent, telephone bills, electric and water charges, stationery and postal charges. *(iv) Student Service Costs* : These costs include the expenditure incurred on games and sports and other socio-cultural activities organised by the students.

Non-recurring or capital costs represent the expenditure on buildings, land, library books, furniture, office and laboratory equipment and other items of permanent nature. The following components are estimated in the analysis: *(i) Buildings*: Generally investment on buildings happens to be the largest component of non-recurring or capital costs. There are two types of expenditure on building: first, annual expenditure on the routine maintenance and repairs of the existing buildings which are classified as recurring expenditure, and secondly, expenditure on building construction, addition and major alteration which are considered as non-recurring costs. *(ii) Library books* : Expenditure on books and journals is treated as investment in capital assets. They are available for use by students and teachers for several years. But expenditure on binding, insecticides and other consumables is regarded as recurring costs. *(iii) Furniture and Equipment*: These items are essential inputs of educational production. They have their own life span and their services could be utilised during their life time. Therefore, expenditures on typewriters, duplicating machines, laboratory equipment, benches, tables, desks, and other durable assets are treated as non-recurring costs while annual maintenance and repairs are a part of recurring costs.

Direct private cost of education had been categorised into academic costs and non-academic costs. Academic costs were

directly related with expenditure on fees, books and stationery incurred by the students whereas non-academic costs were expenditure related with their support and maintenance i.e., food, transport and personal maintenance. The cost of fees incurred by the students were directly collected from the cash books of the colleges while the expenditures on other items such as books, stationery, transport and personal maintenance were calculated from the survey data among the students. The cost of food included the expenditure incurred by the students on their mess bills in the hostel and at home including daily tiffin expenses in the colleges. The rent paid by the students to the hostel and accommodation charges in rented houses were also included in the cost of food. The cost of food for day scholars who live with their parents was imputed on the basis of the size of the family; similarly, the imputed rent was also estimated from the average rent paid by the students who arranged their own accommodations outside hostel. Students received scholarships, stipends and other grants; these amounts were deducted to arrive at the net private cost of education.

Cost of education may be expressed at current (market) or constant prices. Cost of education at constant prices takes care of increase in prices of goods and services and thus represents the real cost of education. When costs of education are computed over a period of time, it is necessary to convert current prices into constant prices because current prices may at times be deceptive especially when an economy is experiencing price inflation. The best solution of this kind of problem is to construct educational price index, based on the prices of goods and services used in educational process. Unfortunately, no such price information or index is available in the state. Thus in the absence of any appropriate price index at the state level, appropriate Net National Product deflators were used to convert current prices into constant prices.

The analyses of data were carried out using simple statistics like percentage, means, standard deviation (SD), coefficient of variation (CV) and regression analysis. The pattern of institutional cost was evaluated by the analysis of the proportionate/percentage shares of expenditure in individual items in the total costs. The various components of

private cost were estimated using the mean, standard deviation, maxima and minima. For showing the variation and variability of private cost of education, the coefficient of variation which is the ratio of standard deviation with mean was adopted.

The Ordinary Least Squares (OLS) regression technique was used to estimate the relationship between enrolment size and unit institutional cost per student and for analysing the time series data on public expenditure on education and unit cost of education as well. The strength of the relationship between the dependent variable and independent variables had been measured by the coefficient of determination, denoted by R^2 which shows how well the overall equation explains changes in the dependent variables and the t- statistic which determines the significance of the relationship between the dependent variable and independent variables.

Traditional economic theory postulates that average cost curve is U-shaped which implies that average or unit cost declines with an increase in output till the optimum size is reached. The relationship between unit cost of education and enrolments which are generally regarded as the proxy of output of education, has also been assumed to have a typical U-shaped curve indicating that the unit cost falls with an increase in enrolments till the optimum size is reached, and later, it increases as enrolments expand. The U-shaped cost curve may be approximated mathematically by the quadratic function or second degree polynomial function:

$$Y = a + bX + cX^2 \quad (1.1)$$

where 'Y' is the unit cost per student, 'X' is enrolment and 'a', 'b', 'c' are the constants for the function. For unit cost 'Y' to be minimum, the following conditions will have to be satisfied:

$$dY/dX = b + 2cX = 0 \quad (1.2)$$

$$\text{and } d^2Y/dX > 0. \quad (1.3)$$

Convexity of the curve warrants that $b < 0$ and $c > 0$ hold together. Solution of equation (1.2) will furnish an estimate of the optimum enrolment size, say X^* :

$$X^* = - b/2c \quad (1.4)$$

Since 'b' is negative, the solution value of equation 1.2 at $X^* = X$ gives the minimum cost that will correspond to the optimum enrolment size (Prakash, 1996(a)). The quadratic function fitted to the cost-enrolment data of different colleges determined minimum cost and optimum size corresponding to it.

Growth rates are estimated using a multiplicative true relationship between the variables concerned. The method of linear least-square is applied on its logarithmic transformation. For instance, the true relationship is

$$Z_t = A B^t v_t \quad (1.5)$$

and the estimated relationship is

$$\hat{Y}_t = \hat{a} + \hat{b}t \quad (1.6)$$

where $Y_t = \text{Log } Z_t$, $a = \text{Log } A$, $b = \text{Log } B = \log(1+g)$, and 'g' stands for annual estimated growth rate.

Scheme of Chapters

The study is divided into seven chapters. Chapter 1 deals with introduction, objectives, methodology and sources of data. Chapter 2 contains a brief review of the relevant literature on the subject. Chapter 3 provides an overview of the development of higher education in the North East. Chapter 4 outlines the growth profile of public educational expenditure in Mizoram along with a brief socio-economic condition of the state. Chapter 5 gives the analysis of institutional cost of higher education. Chapter 6 deals with the estimates of private cost of higher education in Mizoram and finally, chapter 7 gives the major findings and conclusion of the study.

REFERENCES

- Abramovitz, M., "Resource and Output Trends in the United States Since 1890", in *American Economic Review*, Papers and Proceedings, May, 1956.
- Anderson, C.A. and Bowman, M.J., "Concerning the Role of Education in Development." In C.Greetz (ed) *Old Societies and New States : The Quest for Modernity in Asia and Africa*, Collier Macmillan, London, 1963.
- Ansari, M.M., *Education and Economic Development*, Association of Indian Universities, New Delhi, 1987.
- Ansari, M.M., "Educational Expenditure and Economic Growth" in

- C.S.Nagpal, and A.C.Mittal, (eds) *Economics of Education*, Anmol Publications Pvt. Ltd, New Delhi, 1993.
- Bannock, G., Baxter, R.E and Rees, R., *The Penguin Dictionary of Economics*, Penguin Books Ltd, Middlesex, 1981.
- Becker, G.S., "Investment in Human Capital: A Theoretical Analysis" *Journal of Political Economy*, Vol. 70. 1962.
- Becker, G.S., *Human Capital (A Theoretical and Emperical Analysis, with special reference to Education)* NBER, New York, Second Edition, 1975.
- Blaug, Mark., *An Introduction to the Economics of Education* Penquin Books Ltd. 1970.
- Blaug, Mark, Layard P.R.G. and Woodhall, M.: *Causes of Graduate Unemployment in India* The Penquin Press, London, 1969.
- Bowen, W.G., "Assessing the Economic Contribution of Education" in M.Blaug (ed) *Economics of Education-1*, Penquin Books Ltd. Harmondsworth, Middlesex, 1968.
- Bowman, M.J., 'The Human Investment Revolution in Economic thought' in *Sociology of Education*, Vol. 39, 1966.
- Burgess, T., Layard, R. and Pant, P., *Manpower and Educational Development in India 1961- 1986*. Oliver & Boyd, London, Edinburg, 1968.
- Chaudhari, D.P., "Education of Farmers and Productivity" in H.N. Pandit (ed) *Measurement of Cost Productivity and Efficiency of Education*, NCERT, New Delhi, 1969.
- Chaudhari, D.P., *Education, Innovations and Agriculture Development*, Croom Helm, London, 1979.
- Chaudhari, D.P., and Rao, P., 'Private and Social Returns to Higher Education : A Case Study of Delhi Graduates' in *Economic and Political Weekly*, 5/14 (4 April) 1970.
- Central Statistical Organisation, National Accounts Statistics-1994
- Correa, H., *The Economics of Human Resources*, North Holland Publishing Company, Amsterdam, Second Printing, 1967.
- Correa, H., and Tinbergen, J., "Quantitative Adaption of Education to Accelerated Growth" *Kyklos*, vol.15, No. 4, 1962.
- Dennison, E.F., *The Sources of Economic Growth in the United States and the Alternatives before us*, Supplementary paper No.13., Committee for Economical Development, New York, 1962.
- Dholakia, B.H., *The Sources of Economic Growth in India*, Good Companions, Baroda, 1974.
- Fielden, J., and Pearson, P.K., *Costing Educational Practice* Council for Educational Technology, London, 1978.
- Friedinan, M. and Kuznets, S., 'Incomes from Independent Professional Practice' *National Bureau of Economic Research*, New York.

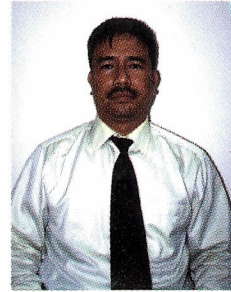
- Government of India, *India Facts Sheets*, Ministry of Information & Broadcasting, New Delhi, 1995.
- Government of India, *A Handbook of Educational and Allied Statistics*, Ministry of Human Resource Development, New Delhi.
- Harbison, Frederick H., *Human Resources as the Wealth of Nations* Oxford University Press, New York, 1973.
- Harbison, F.H. and Myers, C., *Education, Manpower and Economic Growth*, McGraw-Hill Book Company, 1964.
- Houthakar, H.S., "Education and Income" *Review of Economics and Statistics*, vol.41, February 1959.
- Hansen, W.L., "Rates of Return to Investment in Schooling in the United States" in M.Blaug (ed) *Economics of Education-1* Penquin Books Ltd, Harmondsworth, Middlesex, 1968.
- Hicks, N.L., "Education and Economic Growth" in George Psacharopoulos (ed) *Economics of Education, Research and Study*, Pergamon Press, Oxford, 1987.
- Hussain, I.Z., "Returns to Education in India: An Estimate" in B. Singh (ed), *Education as Investment*, Meenakshi Prakashan, Meerut, 1967.
- Indian National Commission for Cooperation with UNESCO (INCCU), *Higher Education in India : Vision and Action* (Country Paper) Paris, 5-9, October 1998.
- International Institute for Educational Planning (IIEP)., *Educational Cost Analysis in Action: Case Studies for Planners, Vol. I + II* UNESCO/ IIEP, Paris, 1972.
- Kendrick, J.W., *Productivity Trends in the United States*, Princeton University Press, Princeton, New Jersey, 1961.
- Kothari, V.N., "Returns to Education in India" in B.Singh (ed) *Education as Investment*, Meenakshi Prakashan, Meerut, 1967.
- Lawma, T., *Market Imperfections and Manpower Planning*, Commonwealth Publishers, New Delhi, 1990
- Layard, P.R.G., and Saigal, J.C., "Educational Occupational Characteristics of Manpower: An International Comparison" in *British Journal of Industrial Relations*, 1966.
- Locheed, M.E., "Farmers' Education and Economic Performance" in George Psacharopoulos (ed) *Economics of Education. Research and Study*, Pergamon Press, Oxford, 1987.
- Marshall, Alfred (1890)., *Principles of Economics*, Macmillan 8th Edition, 1961.
- McClelland, D.C., "Does Education Accelerated Economic Growth" in *Economic Development and Cultural Change*, April, 1996.
- Mayer, G. M., "Investment in Human Capital-Note" in Gerald M.Meyer, (ed) *Leading Issues in Economic Development* Fifth Edition, Oxford University Press, Delhi, 1990.

- Miller, H.P., "Annual and Lifetime Income in Relation to Education" *American Economic Review*, December, 1960.
- Mincer, Jacob., "Investment in Human Capital and Personal Income Distribution" in *Journal of Political Economy*, Vol. 66, No.4., August, 1958.
- Mukerji, K. and Krishna Rao, A., "Education and Economic Development in India between 1951 and 1961: An Empirical Investigation", in B.Singh (ed) *op. cit.*
- Nalla Gounden, A.M., *Education and Development: A Study of Human Capital Formation and Role in Economic Development in India*, unpublished Ph.D. Thesis, Kurukshetra University, Kurukshetra, 1965.
- Organisation for Economic Cooperation and Development (OECD), "Targets for Education in Europe in 1970, Vol.XIII," *Policy Conference and Economic Growth and Investment in Education*, Paris, January, 1962.
- Organisation for Economic Co-operation and Development: *Educational Expenditure in France, Japan and the United Kingdom*, Paris, 1977.
- Panchamukhi, V.R. and Panchamukhi, P.R., "Socio-Economic Variable and Urban Incomes," in H.N Pandit (ed) *op. cit.*
- Pandit, H.N., *Effectiveness and Financing of Investment in Education in India 1950-51 to 1965-66*, unpublished doctoral thesis, Delhi University, Delhi, 1972.
- Parnes, H.S., "Manpower Analysis in Education Planning", *Artha Vijnana*, Vol. 13, No. 2, June 1971.
- Prakash, S., "Projection of Occupational - Educational Structure of Manpower : A Study of Public Sector Industries" in *Artha Vijnana*, Vol. 13, No.1, March, 1971.
- Prakash S., *Cost of Education, Theoretical Explorations and Empirical Prognostication*, Anamika Publishers & Distributors, Delhi, 1996.
- Prakash S., "Optimization of Resource use in Elementary Education in India" in Koti, R.K. *et al.*; (ed) *Studies in Indian Economy* (Prof. P.N.Mathur Memorial volume) Himalaya Publishing House, Bombay, 1996 (a).
- Prakash, S. and Radhakrishnan, C., "Private Demand for Education Analysis of Socio-Economic Factors: A case of Saugar University," *Manpower Journal*, 1973.
- Prakash, S. and Buragohain, T., Theoretical Base of Education-Economy Nexus and Methodology for Accounting of Linkage Effect in Input Output Framework, *Plenary Session on Transformation, Intergration, Environment and Structural Adjustment, Tenth International Conference on Input Output Techniques*, 29 March - 2 April, Seville, Spain, 1993.

- Psacharopoulos, G., "Returns to Education: An Updated International comparisons," in *Comparative Education*, 1981.
- Ramunujam, M.S., "Planning Models for Optimum Allocations of Resources in Education" in H.N. Pandit (ed) *op.cit.*
- Shultz, T.W., "Capital Formation by Education" in *Journal of Political Economy*, Vol.68, December 1960.
- Shultz, T.W., "Education and Economic Growth" in H.G. Richey (ed) *Social Forces influencing American Education*, Chicago, 1961.
- Shultz, T.W., "Investment in Human Capital" *American Economic Review* Vol. 51, 1961.
- Shultz, T.W., *Investment in People: (The Economics of Population Quality)* Hindustan Publishing Corporation (India) Ltd, Delhi, 1981.
- Svennialson, I., *et al.*, Targets for Education in Europe in 1970, in *Policy Conference on Economic Growth and Investment in Education*, Volume II, OECD, Paris, 1962.
- Solow, R.M., "Technical Change and the Aggregate Production Function," *Review of Economics and Statistics*, August 1957.
- Stone, Richard., "A Model of the Educational System" in Richard Stone (ed) *Mathematics in the Social Sciences and other Essays* Chapman & Hall, London, 1966.
- Strumillin, S.G., "The Economic Significance of National Education" in E.A.G. Robinson and S.Vaizey (eds), *The Economics of Education*, Macmillan, 1966.
- Tilak, J.B.G., *The Economics of Inequality in Education*, Sage Publications, New Delhi, 1987.
- Tinbergen, J., and Bos, H.C., "A Planning Model for the Educational Requirements of Economic Development", in *Econometric Models of Education*, OECD, 1965.
- Vaizey, J., *The Political Economy of Education*, Duckworth, 1972.
- Walsh, J.R., "Capital Concept Applied to Man", *Quarterly Journal of Economics*, Vol. 49, 1935.
- Woodhall, M., "Cost Analysis in Education" in George Psacharopoulos (ed) *op. cit.*

The system of higher education in India has witnessed tremendous expansion and transformation during the past five decades. The North-Eastern region is also no exception to this phenomenon. However, the experience in the country so far has revealed that no rational calculation had played a decisive role in the expansion of the system and allocation of resources; even public authorities do not care whether the resources invested had been efficiently used or not. Since resources for higher education are at best limited, it is crucial to ensure their efficient use. Educational cost analysis provides a powerful tool in the hands of decision-makers to evaluate the efficiency of educational institutions in terms of resource allocation and productivity. This study, based on the functioning of affiliated colleges in the region, examines the growth of public expenditure on higher education, sources of educational finances, unit institutional costs as well as private costs. It also assesses the impact of the socio-economic status of family on the educational expenditure of students. The study shows, among other things, that: (a) unit cost of education at the institutional level is dominated by unit recurring cost, (b) there exists an inverse relationship between unit institutional cost and enrolment size, (c) private cost is dominated by non-academic costs and is positively related with the socio-economic status of the parents, (d) institutional costs constitute less than one-third of the total costs, (e) education is relatively expensive in government colleges as compared to private institutions.

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