



Chapter – I

INTRODUCTION

- 1.1 Primary Education - Need and Importance
- 1.2 Place for Mathematics Education at Primary Level
- 1.3 Comparative Perspectives - Mathematics Education
- 1.4 Education System of Bangladesh
- 1.5 Education System of India
 - 1.5.1 Education Scenario of Primary Education in West Bengal of India
- 1.6 Rationale of the Study
- 1.7 Statement of the Problem
- 1.8 Objectives of the Study
- 1.9 Explanation of the Terms
- 1.10 Organization of the Thesis

Chapter – I

INTRODUCTION



1.1 Primary Education - Need and Importance

Primary Education has been the major concern of all nations since it is the foundation of the entire superstructure of education and is directly related with the success of democracy. Its universalization has been taken both as an international challenge and a national commitment.

It is axiomatic that no nation can make any significant and substantial progress without education. Education is a pre-condition to national development and is now considered a birth right of every member of the society. Primary education has been identified and recognized as the starting point for the development process and it is the foundation for the entire educational edifice (Akand and Hoque, 1986). It is instruction for the masses, through the vernacular, in such subjects as will best stimulate their intelligence and fit them for their positions in life (Purkait, 1984).

Primary education is the nation's nursery, and so primary education which is the prime-mover for development of human resources should receive the priority it deserves. In any national scheme of development, primary education should be given the highest priority and importance. It is the foundation stone on which the national edifice is to be built up. For the success of any developmental programme-economic, social or political, elementary education is the first essential prerequisite. For rapid economic growth and transformation, to minimize social distance and augment social efficiency and for proper or efficient functioning of a democratic set up, primary education should be regarded as a stepping stone. In the present stage of world's progress, universalisation of primary education has come to be regarded as an essential condition for a nation's efficient existence. In the judicious exercise of franchise, in an intelligent struggle for economic advancement and in the multiform pursuits for intellectual and aesthetic enjoyment, primary education among the masses of people is supposed to have a chastening and uplifting influence (Purkait, 1984).

Elementary education is, in fact, recognized by many as a 'pure public good', as the benefits from elementary education are immense. The economic returns of primary education are estimated to be not only positive and high, but also higher than alternative rates of return of secondary and higher education (Tilak, 2000). The

contribution of primary education is not restricted to economic returns only. Its significant effects on reduction in poverty and improvement in income distribution, improvement in health and nutritional status of the population, its negative relationship with fertility and population growth, and positive association with adoption of family planning methods, and its positive relationship with general social, political and economic development, and overall quality of life are well recognized.

Many studies regarding the role of schooling in economic development have shown that primary education plays a vital role in national economic development, in developed as well as developing countries. It is seen that primary education contributes to the productivity of the labour force, and at the same time it creates an enlightened and responsible citizenry. The value of primary education as an instrument of social change lies in its capacity to contribute towards equalization and expansion of economic opportunities, in promoting educational and social mobility, in creating social concern and civic responsibility, and in instilling cultural values. It is in this context that universal primary education is viewed as an imperative factor in preparing the future citizens for the task of national development. In fact, at the level of government policy, educational planners throughout the world have been giving a high priority to the achievement of universal primary education.

Primary education is at the very base of the educational system. It serves as the primary layer of the concrete floor of its pyramid. To sustain the system as a whole, it needs to be made very broadbased. What kind of primary education is provided to the budding citizens, determines the quality of life in their playful childhood days. Of course, this has an impact on what they do in their life as a whole for themselves and the society (Anand, 1998). Thus, primary education plays a vital role in the life of all of us. None should be denied of it. For children, it is a man-making teaching-learning process. It is the single most important instrument of social change.

Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedom. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace (Rajput, 1994). It helps bringing out the best in a person. In brief, it promotes physical, intellectual, social, emotional and spiritual development of children. This is possibly the reason why in the Universal Declaration of Human rights, 1948, the

General Assembly of the United Nations proclaimed that Education shall be free, compulsory, at least, in the elementary and fundamental stages. Executive Director of UNICEF James P. Grant says, "Primary education is the core and cutting edge of any 'Education For All' strategy." (Delhi Declaration, 1993).

Primary education is the area of most important focus in the 'Education For All (EFA)' programmes everywhere. After establishing the International organization, UNO and its sub-agency felt that without achieving goals of primary education, it is quite impossible to build-up unity, peace and social integration among different nations, communities and societies. Also, the nations felt that primary education is a key factor for achieving the targets of political, social, economic development and a better quality of life.

In 1946, the international community charged UNESCO with the responsibility of promoting education throughout the world considering its vital importance to the individual and for social well-being. In 1948, the United Nations in Paris proclaimed the Universal Declaration of Human Rights including the right to education. In 1959, the Declaration of the Rights of the Child proclaimed by the General Assembly of the United Nations includes two pertinent principles relating to education. The seventh principle states that the child is entitled to receive education, which shall be free, compulsory, at least, in the elementary stages. He/she shall be given an education which will promote his / her general culture and enable him (or her) on the basis of equal opportunity, to develop his (or her) abilities, his (or her) individual judgement and his (or her) sense of moral and social responsibility and to become a useful member of society (Mohanty, 1994).

In 1986, a special issue of the International yearbook of education on "Primary Education on the threshold of the twenty-first century" was prepared on the occasion of the thirty-ninth session of the International Conference on Education, organized by the International Bureau of Education, Geneva. The responses from the member states of UNESCO were collected, using the following conceptual starting point, "..... it may be useful to indicate that, for the purpose of this inquiry only, the term 'primary education' is understood as a basic stage of education which is either a self-contained phase (of various lengths in various countries) or which forms a part of a longer cycle of general education. Primary education may lead to other kinds of post-primary education, whether secondary or not, or to the world of work in some cases." (UNESCO, 1989).

In 1990, the World Conference on 'Education for All' declaration described the basic learning needs as comprising of "both essential learning tools such as literacy, oral expression, numeracy and problem solving and the basic learning content (such as knowledge, skill values and attitudes) required by human beings to be able to survive, to develop to their full capabilities, to live and work in dignity, to participate fully in development, to improve the quality of their lives, to make informed decisions and to continue learning" (Seshardi, 2000). In 1993, again, nine highly populated countries (Delhi Declaration, 1993) pledged to ensure universal access to primary education to consolidate efforts towards basic education of youth and adults and to improve and expand literacy and adult education programmes within the context of Education For All.

It is clear that International Summits, Conventions and Conferences held during the last decade have reaffirmed the fact that education, especially primary education, plays a vital role in the development of societies. In this point of view the UEE or UPE has been adopted as a national goal and Education For All (EFA) has been regarded as the International goal for promoting national well-being, individual excellence and successful democratization.

Creation of a sound primary education system appears to be the basic component of any strategy for social, political and economic development of a country. Education at the primary level requires special importance as it provides an opportunity for capturing and nurturing talent at the early stage of growth, thereby contributing to the development of a national pool of ability. However, it is important to mention that most of the countries, irrespective of their economic status and political ideologies, have taken the provision of universal primary education in the form of a constitutional obligation.

1.2 Place for Mathematics Education at Primary Level

In every national education system, mathematics occupies a position of central importance in the curriculum, and enormous resources are expended annually to ensure that future citizens are properly equipped for the demands of tomorrow's world. As Napoleon says "The progress and improvement of mathematics is linked to the prosperity of a state (Sidher, 1971). In this complex world of scientific and

technological advancement, the practical value of mathematics is being increasingly felt and recognized day by day.

For most countries in the world, Universal Primary Education means that every child goes to primary school, and that these schools are not streamed by ability. Thus, the offering in mathematics must be such that every student receives the tools for survival, for work, for participating in community affairs and for being a responsible citizen politically (Jacobsen, 1996). There can be no schooling without mathematics in the world. The fundamental education of child consists of three R's i.e. reading, writing and arithmetic emphasizing the importance of arithmetic. The study of mathematics has become indispensable in one's life due to its wide-ranging applications in the present technological society. Mathematics at the primary stage provides a child with the basic mathematical concepts and skills he would need to tackle real life problems. It cultivates thinking and reasoning skills and, therefore, strengthens the intellectual underpinnings of human social interactions.

Mathematics trains the mind of a learner as far as accuracy, simplicity, originality of result and logical thinking are concerned. Due to its very nature, it processes the real disciplinary value; John Lookey also says "No subject could develop ability to reason so well as mathematics." (Shah, 1964). A claim for mathematics is now evolving in the man's minds that mathematics is the central intellectual discipline of technological society. Auguste Comte, the founder of sociology, states in his positive philosophy, "Any kind of knowledge reaches the positive stage early in proportion to its generality, simplicity and independence of other departments." Thus, mathematics enters the positive stage first. Comte called mathematics the basic tool of the mind. It is the most powerful instrument which the mind may use in the investigation of natural laws (Ramnarayana, 200).

Mathematics is also a language; the language that uses carefully defined terms and concise symbolic representations, which adds precision to communication. It is a language that works with ideograms, symbols for ideas, rather than phonograms-symbols for sounds. The equation $2 + 3 = 5$ means the same to all over the world, no matter how one reads it. Furthermore, because of their clarity and precision, ideograms serve as a mental labour saving device. They enable us to perform computations, solve problems, and compute proofs that would be difficult if not impossible in any natural language. These ideograms make algorithms and manipulations accurate and efficient (Thanachaikun, 1986).

Mathematics has played a predominant role not only in the advancement of civilization in general, but also in the development of physical sciences and now has far wider application in other branches as well. Mathematics has been an integral part of school curriculum ever since the beginning of formal education and it continues to be so (NCERT, 2000). However, in a society which is rapidly changing into an industrial and technological society and where economic changes are coming fast, the need for imparting mathematical knowledge to every citizen has gained greater importance. The place of Mathematics in the traditional curriculum had been emphasized on the basis of disciplinary purposes it served. Under the new circumstances, the disciplinary purposes are to be supplemented with the utilitarian purposes which should lay emphasis on the application of the subject in every day life of the people and help in better understanding of the physical, social and cultural environment around the child (Dayal, 1977).

Educators consider mathematics as one of the best media for the development of thinking skills. Mathematics is necessary in order to help people to understand things better - perhaps to understand the jobs on which they might later be employed, or to understand the creative achievements of the human mind or the behaviour of the natural world. It is the particular power of mathematics that its central ideas help us to do all of these things (Shuard, 1984).

Mathematics, at the primary stage of education, has emerged as a major academic priority, particularly in the context of the changing needs of society today and the constant exposure to the vast amount of quantitative data and challenges of technological advancement. A sound and solid foundation in mathematics, therefore, becomes a major concern. In view of the academic demand for providing the child a solid foundation in mathematics in the early years, the need to accelerate in the children development of the prerequisite skills and concepts becomes essential (Kaul. and et.al., 1995). Many people still regard it as a skill subject rather than a content subject. It is true, of course, that there are many skills to be acquired in arithmetic, but arithmetic is far more than a collection of skills; it is a system of ideas. The child who masters these ideas is much better prepared to take his place in the world today, for in modern society mathematics underlies all technological development. It is such an indispensable tool of thought that one, who does not master it, will find himself blocked off from an increasing range off vocational choices (Sharma, 1995).

The main objective of teaching mathematics is to help the child to quantify his ideas, to be precise in his thinking and to develop and utilize spatial concepts in his day-to-day life. Significance of mathematics can also be viewed in the context of the revolutionary changes that are taking place in the field of science and technology which are largely dependent on the strength of mathematical infra-structure (NCERT, 1979; 16). The National Policy on Education of India, 1986(NPE), has rightly visualized mathematics as the vehicle to train a child to think, reason, analyze and articulate logically. Since quantitative treatment and measurements are being increasingly used in many other subjects, the relevance of mathematics is emphasized both in the context of the child's environment and in the context of the child's learning in other areas (Ramachandran and Gupta, 1987).

Mathematics is relevant for its practical applications. After all, examples of the power of mathematics are everywhere, from the engineering of the cars we drive to the prediction of weather. In order to understand the modern technological world and achieve success in it, we must have some knowledge of mathematics (Reese, 1998). The National Research Council of United States reported, everybody counts, by saying, "Mathematics is the key to opportunity". They call for higher expectations and the use of mathematics as "a pump and not a filter".

The present technological society requires daily use of such skills as estimating, problem-solving, interpreting data, organizing data, measuring, predicting and applying mathematics to everyday situations. The changing needs of society, the explosion of the amount of quantitative data demand a redefining of the priorities for basic mathematical skills (Fonacier, 1984; 14). It is a way of thinking, a way of organizing a logical proof. It can be used to determine whether or not an idea is true or at least whether it is probably true. As a way of thinking, it is used to solve all kinds of problems related to sciences, government, and industry. As a way of reasoning, it gives us insight into the power of human mind and become a challenge to intellectual curiosity.

Mathematics is man's greatest intellectual creation and children must be made to experience a bit of the thrill of this intellectual adventure. In science, in industry, in commerce-indeed, in every area of our complex society - mathematics plays a role of ever increasing importance to provide our children with the necessary foundation for their future. In today's world, nobody can live without mathematics even for a single day. Mathematics is intimately involved in every moment of everyone's life. It is a

body of ideas structured by logical reasoning. The importance of mathematics, thus, in the present civilization is beyond any doubt.

1.3 Comparative Perspectives - Mathematics Education

“To Know Thyself Compare Thyself to Others”

Every individual is different from every other. Similarly, nations too differ from each other. International comparison between educational systems more generally has a long history, although it is only recently that it has been motivated by concern for others rather than national self-interest. Comparing, of course, is one of the most basic of conscious human activities: we necessarily and constantly compare in order to make choices and to judge where we stand in relation to others and to our own past. In the more specific context of education, it is important to distinguish the comparing, importing and exporting of ideas, which is an activity intrinsic to educational development, from the task of attempting to devise rules of and procedures for doing so in a systematic way (Alexander, 2000).

Education for international understanding and co-operation is a growing field in many countries; it is possible to find programmes of its nature in universities, in schools and in adult education, but these programmes often need to be radically changed if they are to become meaningful. Today, mankind does not need verbal declarations on international understanding or vague intercultural exchanges. On the contrary, it needs concrete, scientific, technical, cultural and economic projects that reinforce the capacity for self development in the countries. For this very reason, education for international co-operation has to be action-oriented, and fully aware of the concrete problems of national and international societies. (Goedegebure, 1994).

Internationalism implies the awareness of all human beings as members of a single human society, irrespective of national boundaries and other differences. The modern period has seen a remarkable transformation in the means of transport and communication, the tremendous spreading of education, and the notable increase in the mutual contact between citizens of the world. As a consequence, the world has shrunk in size, thereby increasing interdependence even among people who are geographically far removed. United Nations Educational Scientific and Cultural organization (UNESCO), one specialized body of the UNO, is dedicated to the spread

of international understanding through the medium of education in every part of the world (Sharma and Sharma, 2002).

Educational comparison is not merely incidental; a byproduct of idle human curiosity as it were. For, those who have responsibility for the education of others, be they policymakers, administrators, researchers or teachers, comparison is actually essential to educational progress (Alexander, 2000).

Comparative studies in mathematics education have impact on several areas of education including debates about educational policy, instructional methods, and the effects of socio-cultural factors on education (Plomp and Loxley, 1993). There have been great changes in recent decades in mathematics curricula all over the world. Many countries have reformed their mathematics programmes to keep pace with the current developments in various fields of education and technology. Any attempt at reform would take into account local conditions which can vary from one country to another. Nevertheless, reform in all countries finds common difficulties which can be overcome by using the same methods (Aram, 1986).

Mathematics education reform movements have shown different practices in different countries. Some countries have tried to make use of other countries' experience, whereas some countries have tried to find solutions to their problems by seeking indigenous answers. It is, however, believed that the need for promoting international co-ordination and understanding was perhaps never as pressing as it is today (Aram, 1986). The universality of the teaching of mathematics is a recognized fact. Perhaps no other subject is taught so universally as mathematics and the syllabi, methods and objectives of teaching this subject are quite similar in different countries of the world. The nature of the subject is such that it would easily lend itself to the promotion of inter-cultural understanding.

It is felt that to understand the nature of primary mathematics curriculum in Bangladesh and India; it would be very helpful to give a brief description of the education system in Bangladesh and India.

1.4 Education System of Bangladesh

Bangladesh inherited its education system from the British rule in India which was initiated in 1854 through the popularly known 'Wood's Education Dispatch' (Government of Bangladesh (GOB), 1998). The present education system of the

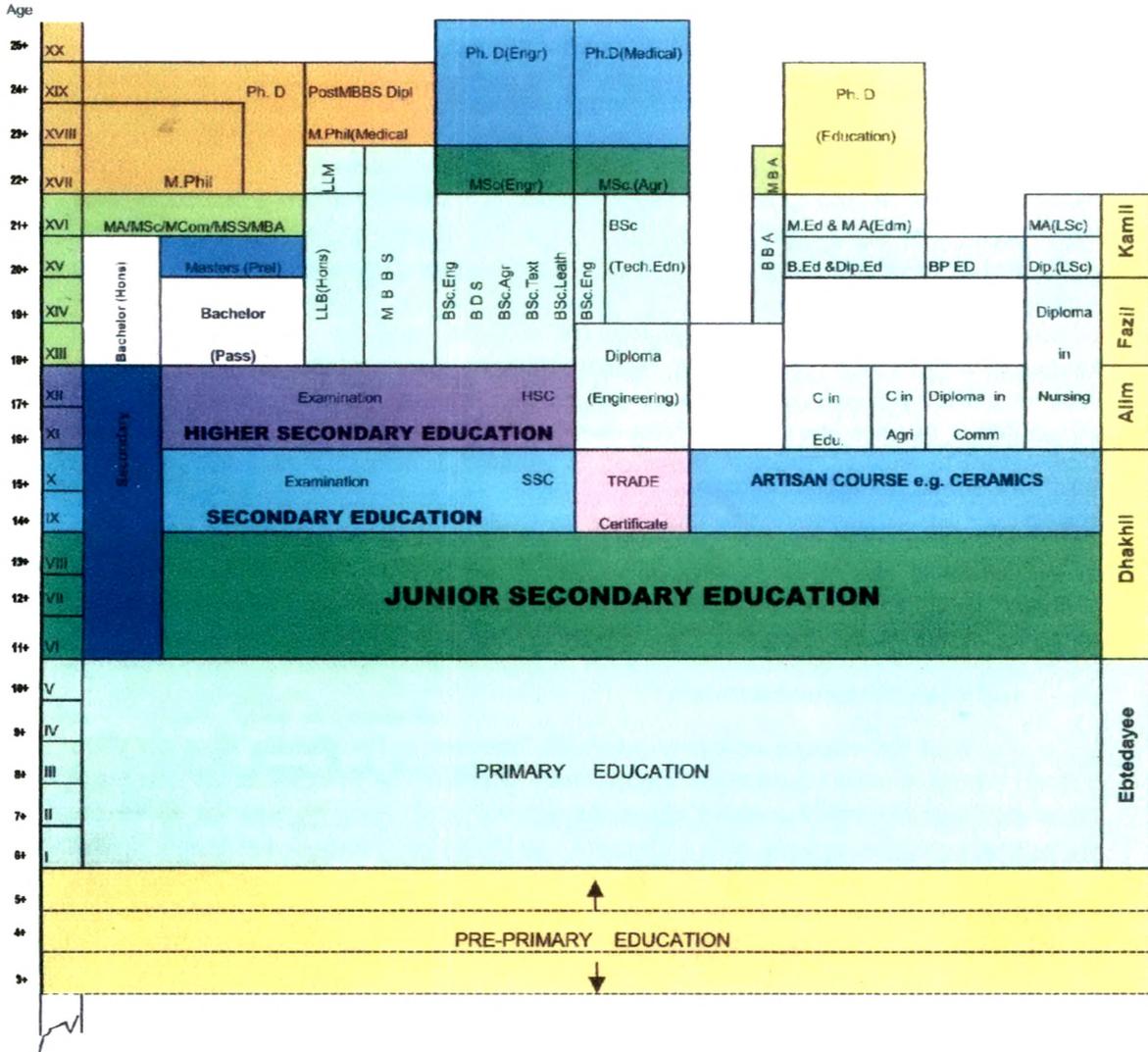
country is more or less a modified version of the one prevalent in the colonial system. In 1971, an independent Bangladesh inherited an outdated education system left behind by our previous rulers who had developed an education system to suit their own socio-economic and political needs. After Independence in 1971, some changes have been made as per recommendations of different commissions. Important among these is Bangladesh Educational Commission 1974, popularly known as Kudrat-E-Khuda Commission.

In 1974, the National Education Commission submitted its report laying special emphasis on mass education, work and life-oriented education, integration of religious instruction with public education system, vocational, scientific and technical education for the country. It also extended the main objective by recognizing primary education as the basis for human resource development and as the fundamental point to start with for the development of the country. The first Five Year Plan and Kudrat-E-Khuda Commission emphasized the need for universal primary education. The Khuda Commission went one step further in its desire to make primary education compulsory up to grade V by 1980, up to grade VIII by 1983. In order to achieve the objectives of primary education in Bangladesh, the commission recommended that appropriate and relevant curricula should be introduced.

The formal education in Bangladesh begins with 5-year primary education which is followed with 3-year lower secondary (junior high school), 2-year of secondary and 2-year of higher secondary education. The University education comprises of 3 / 4-year Bachelor degree followed by 1 / 2-year Master's. Without repetition in any grade or loss of any academic year due to any reason, a boy or a girl taking admission to grade-I of a primary school at the age of 6 should expect to get his/her M.A. / M.Sc. degree at 22/23 years of age (see figure-1.1). A parallel system of religious education also exists with similarly advancing levels through Ebtedayee, Dakhil, Alim, Fazil and Kamil Madrasahs for Muslims; Sanskrit Tols for Hindus; Pali Tols for Buddhists; English Seminary for Christians (GOB, 1999).

Need for basic education is increasing in the world. In this respect, different education commissions and committees including Qudrat-E-Khuda Education Commission recommended to extend duration of primary education from five years to eight for achieving minimum ability and enabling the students for learning throughout their life. It requires to determine duration of primary education at eight years in keeping with the international standard for basic education (GOB, 1997). The

Figure - 1.1 : Education System of Bangladesh



Source: National Education Survey (Post-Primery) - 1999

Ministry of Primary and Mass Education Division (PMED) has been entrusted to formulate plan/policy and monitoring and coordination of programmes of primary and non-formal education. Whereas the Ministry of Education (MOE) deals with the matters relating to post-primary education. The Government has approved a New Education Policy (NEP) in October 2000, according to which, primary education will be extended to eight years of schooling in phases i.e.; 6-year in 2003, 7-year 2006 and 8-year in 2010. At the end of grade 8 there is the first public examination, which must be passed by all candidates seeking to move to the four-year secondary level (grade IX-XII). At the leading end of grade XII there is a further public examination to the Secondary Certificate, which is a requirement for admission to first degree courses and appointment to secretarial positions in government services. While the bachelor's degree requires three years for pass and four years for honours courses, the master's degree extends over two years in the case of pass graduates and one year for honours graduates.

According to Bangladesh Bureau of Educational Information and Statistics (BANBEIS) (2000), there are 76,809 primary schools where near about 20 million children enrolled (GOB, 2001). Though primary school enrollment rates have increased substantially in recent years, secondary school enrollment rates are considerably below those for South Asia as a whole and for low income countries in general.

Bangladesh ranks behind India, China and Pakistan in public expenditure on education as a percentage of GNP (2.2%), gross enrollment ratio at first level (except for Pakistan), and percentage of pupils reaching the final grade of first level education (UNESCO 1993). Out of 16.7 million 6-10 year old children, 6.9 million are not enrolled in primary schools. Gross enrollment ratio at primary level has been over 100% in recent years. However, slightly less than half (47%) of first grade entrants completed the full cycle of primary education.

In recent years, there has been a marked improvement in female enrollment in primary school. The total number of instructional hours in grades one and two is very low compared to that in other Asian countries. Children are taught on an average 444 hours in Bangladesh compared to 1100 in Indonesia and 1235 in China (UNICEF 1993). Classes tend to be large; the pupil-teacher ratio is 63: 1 at the primary level and 28: 1 at the secondary level. Recent studies (Directorate of Primary Education 1996) have indicated that although primary enrollments have improved, completion rates

remain low (47%), daily attendance of teachers and pupils is poor (less than 65%), instructional time is not used to good effect and learning achievements are unsatisfactory (Greaney et.al., 1998).

There is a dearth of information on the quality of educational achievement in schools (UNICEF 1992). Although national assessment of educational progress is not conducted, there is some evidence that the quality of educational provision at the primary level has been deteriorating. From 1996, Government of Bangladesh has taken up a number of steps to address the issue of quality of education at the primary level. IDEAL – Intensive District Approach to Education for All - is one of the projects of the Directorate of Primary Education to improve the quality of education in Bangladesh. The main objectives of IDEAL are to establish and strengthen local level planning and management of primary education, practice improved classroom teaching and learning methods, reduce gender disparity, and promote active community participation. To improve the quality of primary education, an innovative teaching approach known as Multiple Ways of Teaching Learning (MWTL) has been effectively adopted and applied to make teaching more child-centred, participatory and joyful to the children (Directorate of Primary Education, 2001).

Bangladesh follows centralized curriculum system, where all the schools are required to follow the same plan throughout the country. The government has direct control over the establishment and management of school curriculum to be used nationwide. Boards of Education and Concerned Directorate of Education are responsible for academic control and management of the system, within the framework of laws and regulations determined by the government. The Bangladesh National Curriculum and Textbook Board (BNCTB) develop curricula and syllabi for the whole school system starting from grade 1 to grade 12.

The task of reviewing and redesigning primary curriculum was initiated in 1986. The competency based curriculum was designed and developed and instructional materials were prepared during 1987 to 1990. The new curriculum was introduced in primary school in phases from 1992 (BNCTB, 1988). The prevalent curriculum in grades 1 and 2 include Mother Tongue Bengali, Mathematics, Environmental Studies, Religions Education and Arts and Crafts. Along with these subjects English, Social Studies and Science are compulsory subjects in grades 3 to 5.

Various steps have been undertaken by the government such as improvement of curriculum, increase in instructional time, improvement in PTI curriculum, in-service training of teachers and their field level officials. Establishment of Upazila Resource Centers, implementation of Multiple ways of Teaching and Learning (MWTL), introduction of local level planning and Management, and improved inspection and supervision. Despite all these interventions and substantial progress achieved in increasing enrollment, the desired level of quality is yet to be achieved.

1.5 Education System of India

Indian educational system is vast, in terms of numbers of institutions, students, and teachers as well as in the variety of educational activity. The central government's responsibility is mainly for the maintenance and coordination of standards of higher and technical education. The Constitution directs the State to provide free and compulsory education for all children up to 14 years of age. Soon after Independence, priority was given to the introduction of "basic education" (nai taleem, in the words of Mahatma Gandhi), the objective of which is to develop the total personality of the child by providing instruction related to manual and productive work. While Gandhian basic education provided guidelines for the planning of primary education, the search for a suitable system of secondary and higher education led the government of India to appoint two commission namely the University Education Commission and Secondary Education Commission in 1948 and 1952 respectively.

Although some reforms were introduced as a result of the recommendations made by these commissions, a nationally accepted structure of education had to await the conclusions of the Education Commission (1964-66). On the basis of the recommendations of the Education Commission (1964-66), the central government, after consultations with state governments and with the approval of Parliament, issued the Resolution on National Policy on Education in 1968. Thereafter the Resolution remained the basis of educational reforms in India till the formation of the new Policy in 1986. The National Policy on education (1986) initiated special emphasis on the removal of disparities and to equalize educational opportunity. Also, the new thrust in elementary education has emphasized two aspects: (1) universal enrolment and universal retention of children up to 14-year of age, and (2) a substantial improvement in the quality of education. The new education policy (1986)

has given the highest priority to solve the problem of children's drop out rate at the grass-root level all over the country and free and compulsory education up to 14-year of age by 1995.

The formal education in India begins with 5-year primary education which is followed by 3-year middle, 2-year of secondary and 2-year of higher secondary education (Aggarwal, 1993). Primary schools are, by and large, co-educational. Higher education is provided in universities and colleges. Technical and professional courses range from three to five years for a first-degree course to two to three years for post degree course (Vide figure-1.2).

The curriculum framework prepared at the central level provides a broad overview of the school curriculum, including general objectives, subject-wise objectives, suggested scheme of studies, and guidelines for the transaction of the curriculum and the evaluation of pupil outcomes. However, the states consider whether to adopt or adapt the NCERT syllabi and instructional materials. Thus, the NCERT curriculum framework is always a suggestion rather than prescriptive and it is not enforceable by law in the states.

The National Curriculum for Elementary and Secondary Education: A Framework (NCERT, 1988) recommended compulsory core curriculum elements to be taught throughout the country. Most of these core elements are aimed at the development of National identity and a spirit of togetherness leading to national unity. Also, it recommended that evaluation should be treated as an integral part of the classroom teaching/learning process. Furthermore, evaluation, conducted periodically, should provide the type of feedback on student achievement that enables teachers to improve their methodology, if required. It is recognized that both the educational curriculum content and process must be re-oriented in order to bring about overall quality improvement.

India is one of the few developing countries which took the initiative in 1991 to lay down Minimum Level of Learning (MLL) to be achieved at primary stage. This new approach integrates various components of curriculum, classroom transaction, evaluation and teacher orientation (Aggrawal, 1999). Laying down of MLLs is a part of the larger curriculum reform endeavor to achieve greater relevance and functionality in primary education. The implications of this exercise are: (i) Lightening the curriculum of its textual load and also the burden of unnecessary memorizing and irrelevant content of facts; (ii)

Relating textual content with a meaningful process of understanding and application; (iii) Ensuring the acquisition of basic competencies and skills to such a level where they are sustainable and would not easily allow relapse into illiteracy; and (iv) Facilitating mastery in learning not only by brighter children in the grade but also by almost all children including first generation learners (Agrawal, 1999).

In this context, a Government of India committee (under the chairmanship of Professor R. H. Dave) elaborated the MLL curriculum concept that designates the competencies to be mastered by the primary level pupils in each subject, at specific points in time. For the first five years of primary schooling, the MLL covers the mother tongue, mathematics, social science and science (NCERT, 1991).

The commitment to achieve UPE has led to several successful strategies and programmes being undertaken by Indian Government. Some of major programmes are: NFE (1976), OB (1987), NLM (1988), DPEP (1994), MLL (1991), ECCE, EGS, AIE etc. (MHRD, 1997). For overall quality improvement, the Government of India centrally sponsored Schemes for District Primary Education Programme (DPEP, Supported by the World Bank) in 1994 to support the state governments in their efforts to improve access and retention, increase learning achievement and decrease in drop-out in a manner that social and gender inequities are reduced to minimum (MHRD, 1997).

1.6.1 Education Scenario of Primary Education in West Bengal of India

All over India, schools which are affiliated to Central Board of Education, the Elementary education is up to grade-VIII while secondary education is from grade-IX to grade-XII. As per the recommendation of the Education Commission (1964-166), State Government restructured the educational pattern of 10 + 2 + 3 system.

As far as the schools affiliated to the State Boards of Education are concerned, the policy of deciding number of years for study at primary level. It differs from state to state. In Gujarat, the primary education is up to grade-VII, while grade-VIII to grade X is considered to be the time span for secondary education whereas in West Bengal, the elementary education consists of 5 years of schooling from grades I-V followed by Jr. High or Upper Primary Education from grade VI-VIII provided in all Jr. High, Secondary and Higher Secondary schools. A child enters into the system at

the age of 5+ and takes part in the first public examination at the age of 15+ after completion of 10 years of general school education and leaves after completing Higher Secondary stage at the age of 17+ (Government of West Bengal, 1999).

All children up to grade-V are provided with free textbooks written in six languages viz. Bengali, Hindi, Urdu, Nepali, Santhali and Oriya in their mother tongue. At primary stage up to grade-IV students learn their lessons in mother tongue. A second language English is introduced in grade-V. The performance of the students at the stage is evaluated through continuous evaluation process (ibid, 22).

Preparation and renewal of Textbooks are the statutory functions of the West Bengal Board of Primary Education. The DPEP cell of the Board is entrusted with the renewal of textbooks at the primary level and is also associated with preparation of Training modules and with development of Teaching-learning Materials (TLM) (ibid, 40). The curriculum has been divided into two parts, the main thrust being given on the first part. The first (non-scholastic) part consists of (i) Activities relating to physical activities, health habits, games and sports. (ii) Activities relating to creative and productive works and (iii) Activities encouraging understanding own experiences through certain activities pertaining to direct experiences. The major thrust has been given on this part, constituting 45% of the day's schooling hours. The second part is related to studies in scholastic areas where emphasis has been given on gaining competence in the cognitive domains of learning. The subjects to be studied in this area are language (mother tongue), Arithmetic and environmental studies in the form of studying Natural Science, History and Geography. In primary education, the medium of instruction is mother tongue and one-single language (mother tongue) has been prescribed for study (ibid, 17).

In the academic year 1995-96, School Education Department, on experimental basis, conducted Minimum Level Learning strategies. It identified competencies required and introduced Minimum Level of Learning in ten schools surrounding in each of the Primary Teachers' Training Institute. Teaching Manual and Teachers' Training programme were undertaken for its implementation. There was also a regular re-orientation training programme for the primary teachers, conducted by State Council of Educational Research and Training (ibid, 22).

After the adoption of National policy on Education, 1986 a centrally sponsored scheme for restructuring and reorganization of teacher's education is being implemented since October, 1997. This is an additional support for the qualitative

expansion of education under this programme which has been targeted to cover all children of age group 5-9 for primary education. Financial liabilities are borne by the central Government (85%) through DFID and State Government, at a matching grant of 15% (ibid, 40).

The School Education Department is working for promotion and regulation of educational, cultural and physical development in primary, secondary and madrasah education in the state. Under the guidance of the department, two directorates have been functioning (with expanded network at the Block, Sub division and district level office) viz. Directorate of school Education with inspectorates and Directorate of Accounts for monitoring of financial activities. At the district level there are District Primary School Councils which are autonomous bodies for decentralization of overall administration. In primary education, the district inspector of primary education and the district inspector of secondary education and district officer of physical education and youth welfare are the officers at the district level responsible for qualitative improvement in educational, cultural, physical and administrative activities.

The principal function of the directorate of school education consists of administration of its offices at the state level and controlling the inspectorate at the district level for both the branches of primary and secondary education. At present there are 51,000 primary schools with an enrolment of about 85, 00000(ibid, 22).

1.7 Rationale of the Study

The primary education is the foundation of any education system. Mathematics is one of the courses of basic education which is delivered mainly through primary education. In this age of science and technology, one cannot think of general education without sound background of knowledge of mathematics. As Roger Bacon rightly said, "Mathematics is the gate and key of the science." Mathematics is as important as language. Primary mathematics curriculum should therefore be developed keeping in view, the needs of the learners and their society. Quality of mathematics education always depends on the curriculum and its implication in any country.

The aim of mathematics education cannot be confined only to knowledge and skill necessary for everyday life. Knowledge and skill of mathematics are pre-requisites for learning other important subjects (Sho, 1997). Developing logical

thinking with interesting mathematical activities should be also one of the aims of primary mathematics education. By summing up these, one can say that aim of mathematics education at primary level could be

- (i) imparting knowledge and skill,
- (ii) developing logical and rational thinking,
- (iii) application of mathematical knowledge in day-to-day life.

The extent to which these aims are imparted through curriculum in any country is a major question! The detailed study of mathematics curriculum at primary level in any country would answer this question. Comparison of mathematics curriculum at primary level will enable the researcher to study the extent to which above aims are included in the primary mathematics curriculum in Bangladesh and West Bengal of India and transmitted in schools at primary level. The related literature throws light on gaps existing in primary education and poor qualities of curriculum and its implication in Bangladesh. Standard of education depends on the standard and effort of the teachers and teachers' performance depend on standard curriculum (Roy, 1986).

Bangladesh, like other nations, felt the need to modify the existing education system to improve the quality of education. With this felt need, different Educational Commissions and Committees were formed. Finally, competency based curriculum was introduced from 1992 (BNCTB, 1988) starting from grade I-V. Curriculum renewal and development is an ongoing process and no nation can afford to neglect this matter. The curriculum must meet the learner's needs, societal expectations, community aspirations and international comparisons. Bangladesh Education Commission's report (1974) suggested for continuous evaluation and research in the field of curriculum materials.

The Government of Bangladesh brought about a reform in the curriculum and syllabus of primary education through the BNCTB which has already been put into practice. But no systematic attempt has so far been made to bring qualitative improvement in primary education through curriculum research, specifically in the area of primary mathematics curriculum. Hossain and Jahan (2000) pointed out some of the major deficiencies in curriculum development in Bangladesh which include:

- (a) lack of professional expertise in the development of modern curriculum, both in the BNCTB and nationally;

- (b) lack of a solid research base providing assessment information about the previous curriculum and the areas needing revision; and
- (c) insufficient curriculum emphasis on such competencies as understanding, comprehension and application.

In the absence of any empirical study on primary school curriculum in Bangladesh, it has also not yet been possible to evaluate the effectiveness of the existing mathematics curriculum as prescribed by the BNCTB. Even the facilities for implementing the mathematics curriculum in the primary schools of Bangladesh are not known due to lack of systematic research. Whereas various research studies in India have been conducted and reported that learning achievement of primary school children in general and mathematics in particular is far from satisfactory (Das, 2000). In the age of science and technology, a strong base of mathematics is absolutely necessary for all. Therefore, how to develop the basic mathematical competencies among young children is a strong need felt by teachers, researchers and educators.

Periodical revision and reform of curriculum and syllabus must be carried out to make it need centred for the children of the country, to achieve the national goals and for the contemporary world, and at the same time all possible measures have also to be taken for its proper implementation. Implementation of curriculum at the primary schools in Bangladesh and West Bengal of India and its study is of vital importance in determining the effectiveness of the mathematics curriculum and the quality of primary education in these countries.

A thorough inquiry into the status of the mathematics curriculum for the primary schools is necessary to give a satisfactory answer to the questions relating to primary mathematics curriculum in Bangladesh and West Bengal of India. Some of these questions are: How far do the objectives of primary mathematics curriculum reflect in the prescribed curriculum? To what extent are the specified objectives of curriculum in consonance with the objectives of primary mathematics education set by experts from other parts of the world? What are the contents needed for achieving such objectives? How far are these objectives reflected in the prescribed curriculum content and teaching-learning process? How far is the content able to bridge the gap between theory and practice? How is primary mathematics curriculum being implemented in the schools? What problems do teachers face in implementing them? How do the teachers assess their pupils' achievement in the schools and in the grade room?

Documents of national policy of education and review of related literature tell that Bangladesh needs to improve the quality of education by modifying the curricula at all levels. For the sake of improvement in quality of education, Bangladesh cannot adopt ready-made ideal curriculum and education system from any other developed country because the differences of cultural and social aspects of both these countries would lead to failure of the system due to blind imitation. If at all Bangladesh wants to follow or borrow something good as a sample of education system for the sake of better quality of education, she must look into similarities of the culture, language and other aspects of that system from which educational ideas could be borrowed for the better quality of education.

By exchanging information and experience, pooling expertise, sharing facilities, and undertaking joint activities, several countries, working together, can increase their resource base and lower costs to their mutual benefit. Such arrangements are often set up among neighboring countries (sub-regional), among all countries in a major geo-cultural region, or among countries sharing a common language on having cultural and commercial relations. Regional and International organizations often play an important role in facilitating such co-operation between countries (WCEFA, 1990). However, of late there has been more attention to mathematics programmes which are based upon the needs and cultures of the ethnic mixes found in most countries. First looking at UNESCO, most of UNESCO's work is directly with the governments of its Member States, and the mathematics education programme is no exception. Upon request, the mathematics education specialist from UNESCO works with the ministry of education, advising and providing information. UNESCO's principal emphasis on mathematics education has been to promote the exchange of information, to work nationally, and to co-operate with regional and international groups (Jacobsen, 1996). This, in turn, will help the system to lift up the quality of education.

Now looking to the fact that the sharing of Bangla, by Bangladesh with parts of India - offer both possibilities and challenges for cooperation among people in education and culture – in literacy field as well as in substantive study of science, social science and humanities. Even against gloomy background, it is necessary to assert that while neither education nor educational co-operation will alter the basic determinants which politically exist. For example, Bangladesh is known to use Bangla in its judicial and perhaps educational system to a much greater extent than in Indian

West Bengal – and the latter is said to be studying the former (Bhattacharya, et.al., 1993). The Dhaka declaration (December 1985), as it came to be called, underscored the historic significance of the first ever summit meeting of the South Asian Countries and described it as a tangible manifestation of their determination to cooperate regionally, to work together towards finding solutions to their common problems in a spirit of friendship, trust and mutual understanding and to the creation of an order based on mutual respect, equity and shared benefits (Bhattacharya, 1995). Bangladesh and West Bengal of India, is not only a distinct entity in geo-political terms but also shares common historical, cultural, religious and linguistic heritage. Not only that India and Bangladesh have many agreements to their credit to foster all round ties between the two countries but they also share democratic relations and are sharing many common policies in world affairs.

In this context, it is of great importance to study and compare mathematics curriculum at primary level of both countries. This, in turn, will help the researcher to spell out the positive strong points of curricula of both the countries. Such research work will help to give answers to questions raised regarding the achievement of goals of primary mathematics education in context of the present needs of the society, existing gaps of the education system of Bangladesh and West Bengal of India in terms of curriculum design and its implementation and suggestions to modify the primary mathematics curricula if needed for better quality of education and to satisfy aims of primary education. Such comparative study will help to identify strong positive and negative points existing in curricula of both the countries that will further enable to give suggestions for modification of primary mathematics curricula of Bangladesh and West Bengal of India.

Therefore, a comparative study of the primary mathematics curriculum in Bangladesh and West Bengal of India would be of great value, because on the basis of such a study, an insight will be developed into existing scenario and issues related to mathematics curriculum which in turn would guide for appropriate plan of action which may be undertaken for the implementation of a good quality primary mathematics education.

1.7 Statement of the Problem

“A Comparative Study of Mathematics Curriculum at Primary Level in Bangladesh and India (West Bengal)”.

1.8 Objectives of the Study

The objectives of the study are to

- (1) Critically examine the mathematics curriculum for primary education in Bangladesh and West Bengal of India.
- (2) Identify the teaching process of primary mathematics that take place in classes of Bangladesh and West Bengal of India.
- (3) Identify the problems and obstacles in transacting primary mathematics curriculum in classroom situation in Bangladesh and West Bengal of India.
- (4) Identify the major strengths and weaknesses of the primary mathematics curricula of Bangladesh and West Bengal of India.
- (5) Compare the primary mathematics curriculum of Bangladesh with that of West Bengal of India with respect to
 - a. teaching processes in classes.
 - b. problems and obstacles in transaction of curriculum in classroom
 - c. strengths and weakness of the curriculum.
- (6) Provide specific suggestions for revision and modification of primary mathematics curriculum of Bangladesh and West Bengal of India.

1.8 Explanation of the Terms

Curriculum:

According to **Webster’s Third New International Dictionary** –

Curriculum means:

- (i) The whole body of courses offered by an educational institution or its branches;
- (ii) Any particular body of courses set for various majors (Such as engineering);
- (iii) All planned school activities including besides courses of study for organized play, athletics, clubs and home-room programme;
- (iv) (a) General education and breeding and (b) A work schedule.

Dressel, P. L. (1980) defined curriculum as:

Curriculum may refer to the composite array of learning experiences provided by an institution or department or to a fixed course of study (Programme) leading to a certificate or degree. (Cited in Aggarwal, 2000; 3).

According to the **World Book Encyclopedia (1984)**, Curriculum is the whole range of formal studies and learning experiences offered by a school. In most schools, subjects studied in the classroom form the chief part of a programme. But a curriculum may also include independent study and investigation, lectures by outsiders, participation in school athletics, plays, and concerts, educational television programmes, field trips and or service projects in the community. A curriculum organizes all learning experiences to give students the most benefit from them at each level of their school career (Aggarwal, 2000; 13).

Curriculum, in a broad sense, consists of **four major components**: (i) Instructional objective (s); (ii) Content; (iii) Teaching – learning processes; and (iv) Evaluation. However, in a narrow sense and conventionally, a curriculum is a specified course of study. In practice, the latter is accepted by educational functionaries at all levels of education and ordinarily it becomes a document listing content / topics of subject matter to be studied by pupils (**UNESCO, 1986**).

Here, for this study; curriculum refers to objectives and contents prescribed by the Bangladesh National Curriculum Textbook Board and West Bengal Board of Primary Education and teaching-learning processes in classroom situation and/or outside classroom transacted by the teachers in the schools of Bangladesh and West Bengal.

Primary Level: For this study, grade I-V of Bangladesh and West Bengal are considered as primary level.

1.10 Organization of the Thesis

The thesis has been organized into seven chapters. **Chapter one** of the thesis presents the primary education – need and importance, Place for mathematics education at primary level, comparative perspective – mathematics education. Also, in this chapter, education systems of both countries, rationale of the study, statement of the problem, objectives of the study are presented. **Chapter two** presents the review

of related literature that contains studies conducted on mathematics education at primary stage, comparative studies conducted on mathematics education at primary stage, abroad and comparative studies conducted between Bangladesh and India. **Chapter three** presents the plan and procedure of the study. It includes sources of data, sample, construction and description of the tools, data collection and analysis. **Chapter four** presents the critical analysis of curriculum, particularly of objectives and content-areas. **Chapter five** presents data analysis of responses received from mathematics teachers, academic supervisors, experts (curriculum / subject experts), and results of classroom observation. **Chapter six** presents the findings and discussion of the study. **Chapter seven** presents the summary of the study.