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FROM THE EDITOR

This issue of the Journal of Bangladesh Studies is behind schedule and we are cognizant of this unintended delay. As we continue to seek insightful manuscripts for our readers and policy makers, we urge contributors to fit their manuscripts to our needs. In fact, of the submissions that are received, many do not fit the policy-positioning ethos of the journal. Others lack a strong conceptual or methodological orientation, while still others do not conform to our requirements on style, substance, and quality of writing. With an expanded set of reviewers who have graciously agreed to give of their time voluntarily, submitted manuscripts are being subjected to greater rigor than in the past. While we are happy to work with contributors until the double blind review process ensures overall quality, the cycle time may be reduced if the contributors take a look at articles from the recent past and adhere to good writing and editing principles. For new contributors, we also ask that they set up the problem being addressed and the objectives of the study early in the manuscript so that the reviewers are able to determine the paper's purpose and focus quickly.

In this issue, we present four insightful papers that deal with issues critical to Bangladesh: the state of education in the country and policy prerogatives, pricing of irrigation water, socio-economic effects in the Teesta Barrage area after an upstream barrage was built by India in Gazoldoba, and ways of making the Chittagong Port more efficient through public-private partnerships.

Manzoor Ahmed, Director at the Institute of Education and Development at BRAC University, has been a pioneer in confronting the problems and challenges of the education sector in Bangladesh head on. As an initiator of the Education Watch studies, he has lent a strong voice, calling for needed changes in the sector. In his article, Ahmed points out that Bangladesh is not on track to achieve even the modest Education for All (EFA) goals set for 2015 and highlights areas where major deficiencies exist. Access and quality stand out as the major problems. To address these issues he proposes six pillars on which the system must stand to contribute to nation-building. These include quality goals, improving access and participation, introducing bilingualism, exploring ICT-based communication technologies, good governance, and a stable pattern of financing.

We sought commentaries on Ahmed's paper from two educationists. I am grateful to them for expanding on an already rich theme. To their deliberations, I would like to add the imperative of establishing a state-of-the-art research enterprise within the education system that would be constantly engaged in studying the issues and factors that impede the much needed progress in the sector. Knowledge generation or educational research is a fundamental activity that should serve as a cornerstone to strengthen the hands of the politicians, policy makers, and even the local communities to engage in dialogue, make the right choices, and solve the problems that continue to debilitate the system. Today that research is either absent or very weak; decisions that are made to improve the education system are based on non-existent, sporadic, or uncoordinated research conducted by a handful of local and external experts whose skills are often archaic and may be devoid of context that have not offered prescriptive guidelines for improvement. A survey of a mishmash of policy makers and other system participants do not a critical study make! A case in point is the transition in the SSC system of examinations to the letter grade system. Where is the research or even the policy debate that this was indeed a correct decision?

Education is central to development because of its ability to enhance human capabilities. It brings about a change in people's consciousness and develops awareness in them to make life more purposeful. It is through education that a person equips herself to know what she needs to know, enabling her to deal more effectively with others, with her work and also with herself. In the ultimate analysis, the education system must serve the communities in which it is embedded. Is this being accomplished? A casual conversation at one level, employers, will suggest that there is little in common between their needs and what the education system helps produce: a sad depiction indeed of what the education system has been able to contribute that can be better addressed with quality research.

It is time to debate the prescriptions offered by Ahmed so that the priorities can be sorted out and the nation's education system placed on the correct course. To the extent that such a system evolves on the basis of indigenous and innovative knowledge and needs, instead of the well-worn or borrowed knowledge and ideas, the possibility of salvaging the system stands a better chance.

Sonia Akhter provides insights into the pricing of

ground water for irrigation, an issue that has become critical in recent years to riverine Bangladesh. Once coursed by the mighty rivers and their tributaries and distributaries, the issue of pricing water for irrigation seems incongruous. Yet, because of changes in population, agriculture systems, weather patterns and upstream diversion of water by India on all sides (from Farakka to Teesta), the country faces water shortages between November-February. Given the vital role of water in attaining food self-sufficiency, the study argues that ground water for irrigation is substantially underpriced, implying why government projects may not be sustainable. Using a willingness to pay (WTP) framework for the analysis, the author argues how the higher true economic value of water can be used to sustain government subsidized irrigation projects so that the cost recovery of such investments is more efficacious and able to support more farmers on a wider scale where warranted.

M. Fakhrul Islam and Wardatul Akmam look at how the Teesta Barrage Irrigation Project and the area it covers have been affected after another barrage (Gazoldoba Barrage) was built upstream in India to withdraw water, especially when it is needed most during the lean period. The same survey was used in two time periods—2000 and 2007—to assess the socio-economic effects of the new dynamics of water sharing. The study reflects how the people of Nilphamari and Lalmonirhat actually adapted to the new conditions of adversity imposed on them by India's unilateral diversion of water by finding alternative solutions to their water needs. As the socio-economic factors suggest, there have been actual improvements in the region, despite the adversities, that is a testament to the innovative spirit of the people. However, the authors argue that things could have been better if the Joint River Commission could find more effective ways of water sharing or integrating the region into an economic zone to gain from each other.

Finally, Dilruba Khanam and M. Abu Misir address a vital component of the economy—the Chittagong Port—that can be made much more efficient in its operations to facilitate greater economic activity in the country by improving trade flows via imports and exports. Using efficiency indicators, the authors suggest that the port is far less efficient than Singapore, Colombo or Bangkok, leading to container congestion, stressed equipment that frequently break down, and related concerns. The authors suggest an important policy mechanism—public-private partnership or PPP—to confront the issues whereby private capital, managerial knowhow and other value-adding mechanisms may be rapidly introduced to make the port operate at full capacity. The details of implementing PPP deserve a serious look by the nation's policy planners if the overall economic environment of Bangladesh is to be improved on trade parameters. PPP can, in fact, serve as an attractive model in other domains as well to bring about efficiency and improve throughput.

As in the past, the issue was made possible by JBS's various partners: the contributors, the reviewers, editors, office assistants (especially Sue Pennington), printers, etc. To all of them I continue to owe a debt of gratitude.

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Education in Bangladesh: The Vision for 2025

Manzoor Ahmed

ABSTRACT

Noting the assessment of the Education for All (EFA) Global Monitoring Report 2005 that Bangladesh (along with other South Asian countries) is not on track to achieve the modest 2015 EFA goals and similar U.N. Millennium Development Goals, this paper highlights the major deficiencies in the national education system. Deficits in aspects of access to basic education opportunities and establishment of quality standards and their enforcement are identified as the major problem areas. An attempt is made in the paper to construct a vision for the development of education in the next two decades. Fulfilling the vision would call for overcoming the current key deficits and setting and pursuing specific goals for the future. These goals, priorities and strategic actions are indicated in respect of minimum acceptable quality in education, significant improvement in access and participation in education, adoption of bilingualism as a strategic education goal with a high level of proficiency in Bangla and English to be achieved by the completers of secondary education, putting ICT to use in education, rethinking education governance and management, and ensuring availability of a threshold level of resources and their effective use. In conclusion, a consensus-forming process in favor of the vision is recommended. It is suggested that a group of distinguished and concerned citizens could take the lead in facilitating the dialog.

Introduction

The education system in Bangladesh consists of some 150, 000 institutions, 34 million students and over 900,000 teachers. Primary and secondary level institutions naturally form the bulk of the system with about 20 million students in primary education including madrasas and non-formal programs and 11 million students at the secondary level including madrasas (BANBEIS 2003).

Participation in education has expanded significantly in the decade of the 1990s. At the primary level, close to universal initial enrollment has been achieved, although a third of those enrolled drop out before completing the primary stage. Gender parity in enrollment at the primary and secondary levels is another accomplishment of the last decade. In spite of the expansion, overall enrollment ratios remain low at the secondary (about 45 percent of the relevant age group) and tertiary levels (about 5 percent). Effective participation measured by completion of the stage and acceptable learning achievements is much lower than what the enrollment rates may suggest.

What is the prognosis for education in Bangladesh in two decades, hence in the year 2025? Under United Nations auspices in 2000, leaders from member countries including Bangladesh set Millennium Development Goals (MDGs) for the year 2015. With the overarching target of reducing by half the proportion of the population living in serious poverty, the MDGs also included goals on education, health, gender disparities, sustainable development and international cooperation, which all must contribute to achieving the overall objective of poverty reduction.

MDGs in education were defined in terms of participation and completion of primary education by all children and elimination of gender discrimination in education. These are important but modest objectives, which cannot be the totality of educational progress that Bangladesh and other developing countries must pursue in the decade ahead. Nor can these objectives capture the multiple ways education must contribute to fighting poverty and to achieving other national development priorities. The MDGs in education and in other areas have to be regarded as proxies or minimal conditions for development in the different spheres towards which nations must strive.

By the modest and minimal standards of the education MDGs, how are we doing? A global Education for All (EFA) monitoring group set up by UNESCO has been tracking progress in respect of the MDG goals. The 2005 report predicted bluntly that at the current trend and rate of progress, the goals of primary education for all children and elimination of gender disparities in education will not be achieved in Bangladesh by 2015. It can hardly be a matter of consolation that our South Asian neighbors, India, Nepal and Pakistan, were also projected to be in the same precarious position. (UNESCO, EFA Global

Monitoring Report 2004).

Current Status in Primary Education and Literacy

The official view of the situation in Bangladesh is optimistic. Government statements cite the statistics of 97 percent gross enrollment rate in primary education and parity in enrollment of boys and girls at the primary and secondary levels. Officials also note with pride the stipends program for up to 40 percent of the students in rural primary schools identified as poor, stipend and tuition exemption for girls in rural secondary schools, and distribution of free textbooks in primary schools. These measures indeed have resulted in enrollment growth, in general, and of girls, in particular.

A contentious issue is the rate of adult literacy in the country. The Ministry of Primary and Mass Education (MOPME), based on the target of "eradicating" illiteracy in a decade through the Total Literacy Movement (TLM) launched in 1997, declared that the adult literacy rate (for population of age 7 and over) had reached 64 percent by 2002. Independent evaluation carried out by the Education Watch research group, including national sample surveys and applying objective methodologies, revealed that the rate was around 42 percent. The Education Watch statistics, corroborated by other assessments, were accepted internationally and were used in UNESCO, UN and World Bank documents. These studies also showed a major gap in rates for urban and rural areas and for men and women – in the range of 10 to 20 percentage points.

In fact, the low rate and gender gap in literacy, and the absence of a credible and effective strategy to address the situation, contributed to the negative projections about meeting the MDG time-table. Added to this were the deficiencies in quality and access at all levels of education in spite of the very substantial accomplishments in gross enrollment and the reduction of gender gap in primary and secondary schools. While gross enrollment rates, which include children beyond the designated primary school age, have risen, one out of six children of the primary school age of 6 to 10 years is not going school and about one-third of those enrolled drop out before completing the primary cycle. As a result, over 40 percent of the children are not participating in a full cycle of primary education. In these circumstances, equality in enrollment of boys and girls, no doubt a commendable achievement, still leaves an unacceptably large number of both girls and boys out of primary and secondary schools.

The thumbnail sketch above of the basic education situation shows that government policies and programs, including incentive spending for stipends and free textbooks, reflect good intentions, but are inadequate for achieving even the modest MDG objectives in education. The situation at the tertiary level and in vocational and technical education, built on a weak foundation of primary and secondary education, cannot be any better.

Key Problems: Access and Quality

The problems of access and quality in education at all stages are symptoms of a deeper malaise that has developed through decades of neglect. In fact, a system that originated in the colonial era with its inherently restrictive perspective was pressed into service with only patchwork modifications to meet the demands and aspirations of human and national development of an independent nation.

Since the birth of Bangladesh, several national education commissions and committees have been appointed at various times to formulate education policies and priorities in line with national goals and aspirations. Beginning with the Qudrat-e-Khuda Education Commission report of 1974, at least half a dozen such initiatives have been undertaken. The common elements in the diagnosis of problems and recommendations in these reports outweigh the differences. The most important commonality of the reports is that few substantive recommendations have been implemented.

Decades of failure to address major reform needs in education have resulted in an accumulation of problems which have become deep-rooted and intractable. As a nation that has to rely primarily on its human resources to fulfill its vision of progress and development, the failings in education constitute a critical risk for all its development endeavors.

Various analyses of the education sector (viz. sector reviews supported by the World Bank and Japan Bank for International Cooperation), independent studies (such as the Education Watch annual reports since 1999), the PRSP document, and reports and documents pertaining to donor-supported development projects in education (such as those related to the Second Primary Education Development Program and the Secondary Education

Sector Improvement Program) collectively provide an account of education system deficiencies. A longer term view of priorities and needs, based on a historical perspective, can be derived from existing analyses and assessment. They point to the following inter-connected areas which must receive attention in constructing a vision for educational development by 2025:

- Reversing the decline in quality at all stages of education with attention to need-based educational content and competencies to cope with 21st century challenges;
- Building a unified system of primary and secondary education with equitable access for all utilizing flexible modes and alternative delivery formats as required;
- Aiming for bilingualism in the education system with proficiency in both Bangla and English;
- Utilizing fully the potential of ICT as a key strategy for expanding access and improving quality in education;
- Improving governance and management in education; and
- Guaranteeing adequate resources and using resources well to achieve educational goals.

Quality Goals for 2025

Reversing progressive deterioration of educational quality reflected in the skills and competencies acquired by learners is clearly a central concern. A concurrent issue is how to expand educational opportunities in order to ensure participation of all children in primary and secondary education and to achieve wider and equitable participation in tertiary, vocational and technical education. Quality with expanded and equitable access, therefore, is the overarching goal in education. Relevant and need-based curricula and their effective implementation in classrooms are critical concerns in realizing this goal.

Quality of teaching and learning in education sub-sectors

Mention of educational quality can generate a hot debate about its definition. This debate has its value, but in pragmatic terms, quality in education is best reflected in the learning achievements of students. A system of public examinations to measure learning achievements and competencies acquired at the primary level does not exist. At the secondary level, both the validity and the relevance of public examinations are suspect because they focus on rote memorization rather than development of skills and capabilities.

That the quality of primary education is far from acceptable is no news. The drop-out rate, non-completion of the full cycle, and the competency level of learners who complete five years of primary education, cited earlier, testify to the poor quality of the education delivered. A general improvement of the system following conventional solutions (e.g. more textbooks, more teacher-training and more supervision) has been pursued with the assumption that the benefits would accrue to all. The policies for quality improvement have not addressed the specific circumstances and obstacles of various deprived segments of the population, nor have they been based on analyses and diagnosis of the particular situations and constraints. *(*Education Watch 2003/4)

PEDP II (Primary Education Development Program II) aims to bring about significant quality improvement in primary education by introducing common Primary School Quality Levels (PSQL) in the formal schools which serve over 80 percent of students. PEDP II could better fit its label as a sub-sector program for primary education if it did not exclude the possibility of integrating the NFPE (Non-Formal Primary Education) approach into the primary education system, where appropriate. Studies have shown that, although educational quality is poor across the board, non-formal primary education programs perform significantly better than regular primary schools in respect of acquisition of student competencies prescribed in the curriculum and in student retention and completion rates (Education Watch 2000). This is remarkable because these programs, by definition, target the poor.

PEDP II has not taken a coordinated approach including NFPE to reach out to the neglected and the under-served. The potential benefits that may be derived for primary education in general from methods of teacher training, supervision, learning materials, community rapport, and parental involvement in NFPE need to be recognized in an agenda that emphasizes quality with equity. (Education Watch 2003/4)

Secondary education now serves essentially as a screening device for disqualifying the large majority of young people and for selecting a small minority for tertiary education, rather than having a purpose of its own. The curriculum and teaching are geared to preparation for higher education, to which only a

fraction of students can aspire. They do not relate to prospects of gainful employment, entrepreneurship and practical skills, which, of course, need not be a disqualification for further education. (ADB, Secondary Education Sector Development Plan 2000-2010, 1998)

A small proportion of teachers have any professional training (about a third in the non-government schools, which are 98 percent of all schools). Academic supervision of secondary schools is almost non-existent to compound the problem. (GOB, UNDP and UNESCO1992, p.44)

A recently introduced vocational-technical stream, after grade eight, runs counter to general international experience that shows that "vocationalising" formal secondary schools raises the cost of schooling without corresponding benefits in skill development or better employment prospects for students. International experience also suggests that the most useful vocational /occupational preparation in the secondary school is building a sound foundation of communication skills, mathematics and basic science, which make young people trainable for the employment market. (JBIC 2002, pp. 63-64) NEC2003 recommends that secondary education up to class 10 be one unified stream with adequate focus on communication skills, science and mathematics for all students.

The most appropriate way to look at the quality of VTE (Vocational Training and Education) is to judge it from the point of view of external effectiveness. This sub-sector, more than any other, should prove its worth by enabling students to cash in on the benefits of education and training through employment and income. Public sector VTE is regarded as disconnected from the formal and informal job market. The centralized management of the institutions throughout the country is based on standard curricula, courses, and organizational arrangements that limit interaction with local entrepreneurs and employers. Placement rates for VTI and TTC graduates were 40 to 65 percent, and "unemployment is also common among graduates of polytechnics." (World Bank, Education Sector Review Vol. III 2000, p. 9)

Non-governmental organizations such as UCEP (Under-privileged Children's Education Program) appear to be tackling the quality and effectiveness problems better than the public sector programs. UCEP has a high course completion and job placement rate. Per trainee cost in UCEP is 25 to 40 percent lower than in public institutions (JBIC 2002, pp. 65-66). This pragmatic model has useful lessons for viable skill development programs.

In summary, a results-oriented focus based on defined leaning outcomes needs to guide the efforts to improve quality. Key quality inputs such as teachers, learning materials, and essential facilities need to be looked at from this outcome perspective. Assessment of learning of students and performance of schools needs also to reflect the outcome orientation. The inputs and processes need to be managed, and capacities need to be built for this purpose from the same perspective.

Provisions for adequate numbers of teachers and improving their professional skills and competence:

There is a need for adequate numbers of qualified teachers in primary, secondary and tertiary education so that:

- Student-teacher ratio in primary schools is a *maximum* of 30:1;
- Learning time (contact hours) is increased to international levels with full-day (single shift) instruction for all students in primary schools;
- Provisions are made for required numbers of qualified teachers for math, science and English in secondary schools;
- Provisions are made for required numbers of teachers for subjects in colleges proportionate to enrollment in subject areas;
- Effective pre-service and in-service teacher training and academic supervision are provided at all levels; and
- Adequate remuneration and incentives are ensured for teachers to attract and retain qualified people to the teaching profession.

Quality physical and learning facilities at all levels of education:

Provisions for schools, classrooms, learning aids, playgrounds, libraries and laboratories must guarantee essential conditions for quality instruction at all levels. Specific provisions must include:

- Adequate numbers of schools at primary and secondary levels located and distributed to ensure access for all children within a reasonable distance from their homes, especially in undeserved areas such as *chars* and *haors*, coastal areas, and hill areas;
- Adequate numbers of classrooms with sufficient

space for active and learner-centered pedagogy and with provisions for electricity, adequate light and ventilation, and appropriate furniture; and
- Schools equipped with adequate libraries, laboratories, playground, sanitation and water provisions, located in a safe surrounding, protected from noise and traffic.

Quality curriculum, textbooks and learning materials:

Relevant curriculum developed with professional input, reviewed and updated on a continuing basis, and supported by appropriate syllabi, textbooks, and learning materials as well as an effective system of assessing learners' progress and achievement are essential ingredients of quality education. The provisions related to curriculum and learning materials should include:
- An autonomous curriculum development agency for primary and secondary education with adequate professional and technical capacity, performing its tasks without political and bureaucratic interference;
- Common core curricula at the primary and secondary levels which can be supplemented by appropriate content for different needs and circumstances of communities, regions and groups of learners;
- Textbooks and supplementary learning materials prepared by commercial publishers or non-profit organizations subject to conformity with national curricular objectives and quality guidelines; and
- Continuing learning assessment within institutions as well as public examinations at primary, secondary and tertiary levels which promote the learning of defined competencies, knowledge and skills, rather than rote memorization of texts.

Access and Participation Goals for 2025

Universal primary education access and completion up to grade eight:

The essential measures will include:
- Compulsory primary education extended to grade eight from present grade five;
- Step-by-step expansion of school facilities, classrooms and recruitment and training of teachers planned for each upazila to achieve the target of universal primary education up to grade eight;
- Planning for step-by-step progress with intermediate benchmarks for enrollment, prevention of dropout and completion of grade eight primary education by all children undertaken in each upazila;
- Inclusive primary education to accommodate and serve children with mild and moderate disabilities; special provisions planned for children with disabilities that would prevent them from participating in regular schools; and
- Assurance that expansion of access and participation will not compromise essential quality criteria indicated above.

Completion of secondary education (grade ten) by eighty percent of the relevant age-group:

- Schools, classrooms and teachers must be added to the system of secondary education to increase enrollment gradually by more than double from the present net rate of 45 percent;
- High dropout, repetition and failure rates at the secondary level must be prevented to achieve 80 percent completion rate; and
- Quality criteria regarding teachers, facilities and learning materials must be established and enforced to ensure the achievement of targeted completion rate.

A major expansion of post-primary vocational and technical education:

- Vocational and technical education opportunities at the post-primary level must be increased substantially to ensure increase in participation from the current rate of about three percent to at least 20 percent of the relevant age group in order to prepare those young people who do not continue in formal education for the world of work;
- New models of effective and high quality vocational and technical education must be designed to be responsive and adaptable to changing local, national and international market demands; and
- Government focus on policy-making, regulatory framework and overall planning must promote public-private collaboration and complementarities in provisions for market-responsive vocational and technical education.

A major expansion of tertiary education opportunities ensuring quality with equity, so that:

- Participation in tertiary education is increased

from the present level of under 5 percent to 20 percent of the relevant age-group in mainstream higher education institutions (universities, colleges and professional institutions);
- ICT-based and distance-mode education through Open University programs and extension programs of universities and colleges should provide extensive opportunities for higher education, professional upgrading and pursuit of personal development;
- A comprehensive and coordinated planning of higher education including public and private and general, specialized and professional colleges and universities aimed at meeting the demand for expanded participation, developing centers of excellence in different fields of higher education, and promoting educational, cultural and scientific focal points in selected institutions of higher learning in various regions and districts of the country.

A literate citizenry and lifelong learning opportunities:

- Elimination of illiteracy through effective universal primary education and basic non-formal education for youth and adults through establishing a network of multipurpose community learning centers; and
- Encouragement, support and incentive to community, voluntary and non-governmental organizations and the private sector to create and manage community learning centers, ICT centers and education programs for youth and adults as the building blocks of a "learning society."

Equitable access to education achieved through:

- Government policy and regulatory framework formulated for core curriculum standards and basic quality criteria for all children irrespective of provider organizations, geographical locations, and social and economic background of students at the primary and secondary level education institutions;
- Madrasa education, whether receiving public subvention or not, brought under regulatory framework to enforce basic education quality criteria and core curricular standards so that all children acquire basic science, mathematics and language skills and grow up to be productive citizens; policy regarding madrasa and other religion-based education reviewed and criteria for public funding support for such education established;
- Private and proprietary institutions including English medium institutions required to incorporate the core curricular standards and maintain common quality criteria for academic provisions and physical facilities; and
- The aim of equality of education opportunities regardless of differences in economic, geographic, ethnic or other factors promoted through regulatory framework for education, provisions for financial aid and scholarships, and economic incentives applied to both public and private institutions at all levels.

Bilingualism Goals for 2025

Literacy and communication skills constitute a key objective of primary and secondary education and are essential tools for further learning and success in life. A child's cognitive development and academic performance are dependent on language proficiency. One's mother tongue is the natural and pedagogically appropriate medium of instruction. In addition, proficiency in English has become particularly important because it is the dominant global language and the window to the world of science, technology, research and the limitless store of readily accessible information and knowledge in today's information age. In this era of ICT, individuals have to be proficient in a popular and universally used medium of communication to be competitive globally. We ignore at our peril that English is the universal medium.

Historically, the region of Bengal was well-served by a system of education in which Bangla was the medium of primary and secondary education, with English introduced as a second language from grade three in primary school, continued through secondary school, and used as the medium of teaching at the tertiary level. All who went through secondary education became bilingual – capable of functioning in both Bangla and English. This advantage was lost when in the post-liberation era Bangla was made the medium of instruction in higher education. Not only was the incentive to learn English lost, but the supply of qualified English teachers for primary and high school also diminished. It became a vicious cycle and the English advantage that the educated people in South Asia continue to enjoy was lost to Bangladesh. A general deterioration of quality in education over the years led to the phenomenon of college and university graduates unable to communicate

effectively either in Bangla or English.

One demagogic response to this situation was to introduce in the early 1980s instruction in English from class one in primary school even though very few primary school teachers had English proficiency. The time wasted on English meant that precious time was taken away from Bangla and math from already low teaching time in primary classes, which were predominantly double shift.
The private sector responded with the proliferation of English medium schools from KG to the secondary level which served only a small proportion of the children who belonged to the relatively well-off stratum of society. The government followed suit by re-introducing English in the Cadet Colleges which have highly selective admission. There are also plans for setting up model English medium schools with government support in district and upazila towns. These measures do not address the basic problem of the quality of language instruction in English and Bangla in the mainstream schools for the vast majority of children.

The 2025 goal must be to restore the historic bilingualism that prevailed in this region and to adopt urgently more immediate strategies which would redirect the educational system towards this goal. Actions that are needed at different stages of education from primary to tertiary are the following:

Effective language instruction at the primary and secondary stages:

- A policy of Bangla as the medium of instruction in all primary and secondary level institutions receiving public funding should be adopted with provision for teaching English as a second language effectively. Similarly, in the non-government English medium schools, a high level of proficiency in Bangla by all students should be ensured;
- At the primary level, building the foundation of literacy and language development in the mother tongue should be the main task in the first three years. At the primary level, English should be introduced only at a basic level in grades four and five. The aim should be to teach English effectively in the high school in grades 6 to 10 to enable students to acquire functional proficiency in English; and
- To achieve the goal of bilingual proficiency, modern teaching techniques and learning aids for teaching English as a second language should be used; to overcome the shortage of English teachers, people with English proficiency such as retired civil servants and people from the private sector can be given pedagogic orientation and pressed into service on a part-time and contract basis.

English at the tertiary level:

- In publicly supported tertiary level institutions, English should be used as the medium of instruction in physical science, mathematics, technology and specialized professional fields such as medicine, engineering and business. In other areas, such as humanities and social sciences, the options of either English or Bangla should be available.
- It is expected that private universities and higher institutions will mainly use English as the medium of instruction. However, the same options as for the public institutions should apply to private sector higher institutions to use English or Bangla in humanities and social sciences.
- Government should encourage and provide incentives to colleges and universities to prepare qualified teachers of English in order to overcome the shortage.

ICT-Based Education Plan for Bangladesh by 2025

ICT, especially the internet-based communication technologies, as well as electronically stored and archival materials and accessibility to the sources of knowledge they offer, has opened up unprecedented possibilities for education and learning. The best of the contents in various fields of study, the most authoritative expertise, and the most effective instructional methodology can be available through ICT to learners and institutions anywhere in the world. The quality deficiencies in terms of library and laboratory resources and qualified instructors most common in developing country institutions can be compensated by ICT if its potential is utilized imaginatively.

No society can function effectively in the information society without taking full advantage of ICT. Bangladesh will continue to lag behind other parts of the world unless there are interventions to increase the application of ICT in the education system. Educational institutions at all levels in Bangladesh

must utilize the power of modern information and telecommunications technologies to provide world-class quality education and training to citizens.

ICT does not automatically improve the education system: How ICT can be put to use in the specific context of Bangladesh education has to be understood. We have to use ICT to improve the delivery of education and broaden the range of options available for distance learning. Policy and strategy have to be tailored to local circumstances, and locally appropriate technologies have to be used to maximize the benefits and minimize the costs. (World Bank and AUSAID, Virtual Colombo Plan 2001)

Information and communication technologies (ICTs) facilitate the flow of information and knowledge, making these globally accessible at a reasonable cost. With increasing use of a variety of approaches in learning in the information age, learners are able to move away from being taught mostly in lectures or direct training sessions. They can have increased *flexibility* in learning—they can have more say in what they learn, when they learn, and where and how they learn.
That's the new reality.

New knowledge and developments in learning science and pedagogy underscore the importance of learning environments that suit students' needs and interests by offering them the choice of increased flexibility. No one single learning delivery method is capable of supporting the kind of flexibility that learners need. For example, physical classroom instruction limits the access to only those who can participate at a fixed time and location, whereas a virtual classroom event can include remote audiences and, when followed up with recorded lectures or information resources, can extend the reach to those who could not attend the event at a specific time. A mix of traditional and new learning approaches and technology - i.e. the strategy of blending learning approaches - can get the right content in the right format to the right people at the right time. Blended learning combines multiple delivery media that are designed to complement each other and promote flexibility in learning. It mixes various purposeful learning activities, including face-to-face classrooms, live e-learning, and self-paced learning (Khan 2005). The following goals for the development of an ICT-based education plan by 2025 are proposed:

Adoption of ICT-based learning approach as a key strategy for expanding the reach and improving the quality of education:

- The multi-dimensional ICT-based learning framework utilizing the attributes and resources of the internet, digital technologies and other modes of learning should be adopted as a key strategy in educational development in the next two decades;
- Special consideration should be given to ICT connectivity and accessibility for educational purposes. Bandwidth and spectrum of radio and television wavelengths should be allocated for education. Planning for connectivity infrastructure and regulations should promote and facilitate educational use of ICT;
- Research and technical collaboration should be directed at creating Bangla language portals and searchable databases for use in primary, secondary and adult education and teacher training; and
- Opportunities should be actively pursued to participate in exploratory and experimental programs for affordable computers for primary and secondary schools.

ICT in tertiary education:

- "ICT in education" standards should be developed for universities and institutions of higher education. They should be encouraged and supported to develop ICT plans for improving quality of instruction, expanding options in course offering, upgrading teacher skills, and enhancing library and laboratory resources;
- Central and regional digital libraries and resource centers should be developed which can serve institutions in their respective regions. Access to international library resources, research databases, and journals should be arranged for the regional resource centers on behalf of institutions in the region; and
- The blended learning approach combining conventional and digital technologies should be promoted and supported to create *the virtual university* to complement and supplement the conventional higher education institutions.

Governance and Management in Education by 2025

Governance issues:

Governance and management issues can be said to bring out in sharp relief the problems of the education system. All of the major problems of the education system can be attributed directly or indirectly to governance and management of the system. The administration and management procedures and processes are ruled by regulations and practices based on tradition, custom and precedence rather than responsiveness to changing needs and conditions.

Concern has been expressed in the Education Commission reports of 2000 and 2003 about rampant indiscipline, student unrest and other adverse influences of politicization of education decision-making. The related problems of corruption and mismanagement, spawned and nurtured by partisan politics, when disciplinary and remedial action cannot be taken, have become the most serious obstacles to educational reform and change. Pro-poor changes in the education system proposed in the PRSP cannot succeed unless the political obstacles to change can be removed or at least mitigated. The poor suffer most from this failure of the system because the rich and the elite can opt out of the system and go to private institutions or abroad, as many have.

Overall sectoral policy-making, coordination, and oversight:

An important systemic concern is how the education system as a whole and its sub-sectors function to make their contribution to meeting key social goals, including fighting poverty. It is a question of vertical and horizontal linkages and articulation within and among sub-sectors of education and the possibility of taking a systemic view of the organizational structures and function of the system and sub-systems.

The overall organization and management of education, for example, show critical disjunctions and discontinuities. At the primary level, the four major streams - the government and non-government registered schools, the madrasas, non-formal primary schools run by NGOs, and the proprietary English medium schools - operate with differing learning objectives and academic standards, with little opportunity for horizontal movement of students, and no interaction among organizational authorities running these different streams. The same applies to the secondary level, in respect of the parallel streams in general secondary education, madrasas, proprietary schools and post-primary vocational and technical education.

At the tertiary level, a system-wide view - embracing colleges, universities, professional and specialized education under public and private management; the potential for specialized training by professional bodies; and how these together match the demand for high level skills - does not exist.

The institutions of higher education include a variety of educational enterprises. Universities are governed by acts, orders and ordinances. Dhaka University, for example, was established through the DU Act of 1920. The act underwent several changes, such as the ordinance of 1961, the Dhaka University Order of 1973 and its amendments in 1997. The Order of 1973 revived the concept of autonomy of universities, restored the senate and established the principle of collective leadership of the vice-chancellor in the Syndicate.

In 1992, higher education witnessed the enactment of legal frameworks in three vital areas: establishment of private universities, distance education through Open University, and management of college education through the National University. Acts for setting up 12 new universities of science and technology was passed in the Parliament in 2001. The University Grants Commission serves as an intermediary between the government and universities in respect of financial allocations. It also approves and monitors academic programs of all universities including the private ones.

All of the concerns about horizontal and vertical links among sub-systems point to the need to rethink organizational structures, functions, and roles in the education system. A systemic approach has to contribute to overall education system goals defined by society's overarching priorities, such as poverty alleviation. The systems view will have to address broader human resource development issues, going beyond the parochial concerns of education sub-sectors. India, for example, has opted for a super-ministry for human resource development which coordinates the work of different ministry and department level agencies and organizations involved in various aspects of human resource development.

Thailand and Indonesia have permanent statutory commissions with similar functions. NEC2003 has recommended a permanent National Education Commission.

Allocation of authority and function at the central level:

The distribution of authority, functions and capacities among central entities - Ministries, directorates, and other support institutions - has been identified as a serious management issue. A need expressed by many is to redefine the division of roles and responsibilities between the secretariat of MOE, MOPME and the Directorates - ceding more of the responsibilities for planning, initiating policy reforms and overseeing policy implementation to the professional staff of the Directorates. A consequence of the present situation is that insufficient time and effort can be devoted to the critical functions of strategic policy development, inter-sectoral and intra-sectoral coordination and general public interest watch at the Ministry level (Ahmed et al., Education Sector Mapping 2004).

Decentralization and devolution of responsibility and authority:

The centralized structure of management of both government and government-assisted institutions has not changed over the years in spite of the rhetoric about decentralization. In recent years, increased politicization of education management has led to greater centralization with many small and large decisions, which should be disposed of at the directorate, district or upazila level, ending up at the highest level in the central ministry. Salary subvention and *ad hoc* grants paid to non-government institutions by the government, and enforcement of compliance to regulations for this purpose have provided an avenue for exercising various forms of central control over these institutions. The present practice of having the local MP, a political personality or the district administration head as the chairmen of governing bodies of all or many secondary schools and colleges in the locality is widely seen as a detrimental form of politicization leading to misuse of central compliance regulations (Ahmed et al., Education Sector Mapping 2004).

At the primary education level, the PEDP II Macro Plan says, "Fundamental to the process of quality improvement in primary education is the principle of decentralization and devolution of authority and responsibility to middle and local levels of the education system.…A distinctive thrust of the of PEDP II is to increase authority and accountability, and enhance resources at school level to achieve quality improvement in learning with equitable access. In line with this approach, key outreach support mechanisms will be developed at the upazila level… additional functions will be assigned to schools and upazilas, which will be strengthened in terms of infrastructure and staff." It would be important to ensure that these promises are actually fulfilled (PEDP II Final Plan 2002, pp. 48-49).

The quality of education can be enhanced and schools can be held accountable for performance when individual institutions take responsibility for managing their own learning programs. In the case of vocational and technical training institutions, for instance, this is the only way to assess and respond to skill demands in the local economy and to adapt to specific opportunities and circumstances.

Even in the current generally bleak picture, exceptional institutions which have earned a good reputation actually take greater responsibility for their own management, usually through good leadership of a head of the institution and support of an enlightened managing committee. These can serve as the model for a gradual move towards greater institutional responsibility and accountability. What is needed, therefore, to improve governance and management include the following

Education governance freed from partisan politics:

- Inasmuch as student fronts of political parties have become the prime source of violence, indiscipline and disruption of academic life as well as crime and corruption on campuses, a consensus has to be developed to impose legal restrictions on student front organizations of political parties; and
- A consensus has to be forged regarding political parties restraining themselves from involving teachers and teachers' organizations in partisan politics; educational decision-making including those on appointments, transfers and promotion should be protected from extraneous political influence.

A comprehensive law for national education:

- A comprehensive legal framework for national education should be developed in line with other

Asian countries such as Indonesia, Thailand and China. Such a law would provide the basis for implementing rights and obligations regarding education indicated in the national constitution and in international treaties such as the Convention on the Rights of the Child (CRC) and the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW); and

- The comprehensive education law would spell out rights, responsibilities and obligations of citizens and government agencies at different levels, principles of decentralization and accountability, regulatory framework for different types of education programs and institutions, and principles of defining and protecting public interest in education.

Policy-making and coordination structures:

The Education Commission Report of 2003 suggested a permanent and independent National Education Commission as an institutional mechanism for public debate and scrutiny of educational policies and priorities and to protect education from undue political interference. The demand has been expressed for a strong and autonomous body, replacing the ineffective University Grants Commission, for greater coordination, the serving of national development needs, and the maintenance of standards for higher education. (UGC, Strategic Development for Higher Education, Draft 2006)

- A permanent National Commission on Education should be established, composed of distinguished and respected representatives of the major stakeholders – the civil society, the academic community, and the government education establishment – answerable directly to the national parliament. The Commission should be a statutory body with functions and status specified in a national education law. It should have a secretariat with technical capacity for policy review and evaluation of the performance of the education system. The Commission may provide an overall report on the national education system and a specific aspect or sub-sector of the system in alternate years; and
- A National Higher Education Council, established as a statutory body, would replace the University Grants Commission, and would have as its main functions to articulate policies and priorities in higher education in tune with the needs of the nation, set and maintain education standards, help mobilise resources for higher education and set principles and criteria for effective use of resources, and promote and protect the academic autonomy of higher education institutions.

***Decentralization of authority with accountability in educational management to local level and individual institutions*:**

- A structure of decentralization of education management should be developed which will assign central authorities such as the Ministry, Directorates and Boards broad policy and regulatory responsibilities, instead of the prevailing pattern of extreme centralization and non-transparent decision-making regarding activities, institutions and personnel;
- Planning and management of equitable access and enforcement of quality standards should be primarily at the district and upazila levels; individual institutions and their managing bodies should be provided incentives for taking greater responsibility and being accountable for meeting agreed performance standards;
- At the tertiary level, institutions should in principle be autonomous within a framework of regulations and standards developed and enforced by responsible bodies such as academic accreditation bodies and the Higher Education Council; the degree of autonomy of individual institutions would be progressively enhanced, based on their performance; and
- The professionalization of educational management should be augmented.

Education Finance by 2025

A pattern of simultaneous under-resourcing and waste characterizes financing of education in Bangladesh. It is a *low-cost and low-yield system*. Per student primary education expenditure is about $13 and for non-government secondary education it is $16 (BANBEIS 2003). The low per capita and total cost is no reason for satisfaction, because, educational quality – judged in terms of learning outcome, the pedagogic process and essential inputs – is clearly the victim of this situation. There is a *mismatch of financing and objectives.* Total national education expenditure, especially public budget allocation, around 2 percent of GNP, has to increase substantially in the medium term to meet national goals and priorities regarding expansion and quality improvement in education. The share of the

government budget for the education sector would need to rise from under 15 percent in 2000 to 26 percent in 2008 in order to achieve essential quality improvement (World Bank, Education Sector Review Vol. I, 2000, pp. 58-108).

Staff compensation dominates the recurrent budget (97 percent of the total) in primary education and is comparably high at other levels. This leaves very little funds for other essential quality inputs such as learning materials, upgrading of teachers and academic supervision.

There are high *incentive expenditures* in primary and secondary education. Development expenditure is dominated by the incentive payment in the form of stipends both at the primary and secondary levels. Stipends at the primary level amount to two thirds of the estimated development budget from the government's own resources and one third of the total primary sector development program (PEDP II). The important policy question that has arisen is whether the benefits in terms of participation, equity and quality improvement would not be better achieved by spending directly on improving inputs and performance in school. (Knowles 2001)

The experience of the NFPE program of the NGOs shows that the problem is of supply - offering quality schooling at the right time and place and in the right way without a direct cost burden on families for unofficial fees - rather than of creating demand by offering stipends. Such incentives in fact may defeat the purpose, if resources cannot be provided for essential quality inputs.

In principle, the generous system of public subvention for non-government institutions at all levels could be an important leverage for maintaining and enforcing quality standards in the non-government institutions. In practice, it fails to work this way because of the weak capacity of the regulatory and supervisory organizations in the government, and the intrusion of partisan politics in educational management.

Education Watch studies and other reviews have shown that at the primary level, average direct costs for households is comparable to per student public expenditure, although primary education is supposed to be free and compulsory. At the secondary level, depending on the type of institution, households spent multiples of per student public expenditure. (Education Watch 2003-4, Education Watch 2005)

Education finance arrangements reinforce *the pattern of inequity* in the education system. The share of benefits enjoyed by households from public spending in education rises with income levels of households at all stages of education, but especially in secondary and tertiary education (World Bank, 1998). In primary education, the expenditure roughly corresponded with income distribution of the population. But, in fact, effective spending and benefits, counting those who actually complete the primary stage, is far from equitable. The *significant household contribution for education* is not taken into account in the government public financing strategy for advancing policy objectives such as equity and quality improvement. The following may be considered to improve resource flows in the sector:

Ensuring adequate resources for quality education

- The proportion of GNP devoted to education in the public sector should be increased from around two percent at present to around 5 percent, which would still be below the average for developed countries, but at least in line with the average for developing countries;
- The proportion of government budget devoted to education should be doubled in the next two decades from the present level of around 15 percent; for Bangladesh, no other sector of national development can claim a higher priority; and
- Medium term budgetary framework (3 to 5 years) needs to be developed for both development and recurrent expenditures in education in order to achieve the target for ensuring adequate resources for education.

Ensuring cost-effective use of education resources

- The effectiveness and cost-benefits of high transfer payments (such as stipends and free tuition) should be critically assessed in terms of their impact on equity in participation, quality of education and learning performance of students;
- Adequate resources should be available for essential quality inputs for the education system – such as qualified and motivated teachers, learning materials and aids, and physical facilities; criteria for optimal allocation and utilization of resources should be developed and applied in sub-sectors and programs of education and individual institutions; and

- Public subvention and incentives to educational institutions should be linked to commitment and fulfilment of agreed performance criteria and targets; greater autonomy and control of resources can be offered to institutions that prove their capability to use resources effectively.

Promoting public-private complementarity and partnership

- The principle of public and private sector complementarity and collaboration in education to mobilize the necessary resources for improving and maintaining acceptable quality standards in the national education system should be recognized and education financing policies and strategies developed accordingly. Populist political promises, reflected in the manifestos of parties and pronouncements of leaders, to bring all education into the public sector and make it free of cost to beneficiaries, are impossible to follow through and are not helpful in developing rational policies and strategies;
- Financial allocations in the public sector, especially government subventions and grants to non-government institutions, should be provided with the aim of fulfilling specific objectives and targets in respect of equitable access and maintenance of quality standards in education sub-sectors; and
- Regulatory provisions as well as financial and tax incentives should be formulated and applied to all private sector institutions, including proprietary English medium institutions and private universities, to encourage participation of students from poor families and to promote equity objectives in general.

Conclusions

The daunting challenges in the area of education and human resource development in the next two decades require not only envisioning the future with boldness and realism, but also preparing the groundwork with seriousness and determination so that the vision becomes reality. A vital component of this groundwork will be to begin the process of building a consensus on the vision itself. An important step towards this end will be to embrace the application of ICT in education to improve the system at all levels with the help of the proposed ICT-based learning framework. A second critical step may be to bring together a group of distinguished and committed citizens to lead the consensus-building process. The group also can be a precursor to the proposed statutory national commission on education. A central issue around which the consensus-forming dialogue may begin is the purpose and content of the proposed national education law that will translate the constitutional provisions and common national aspirations regarding education into a legal framework for educational development.

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Commentary

Munir Quddus

Manzoor Ahmed in this article addresses a range of issues in the education sector of Bangladesh. The scope of the paper is comprehensive – covering the primary, secondary and higher education – with a good review of the existing literature, ideas on improvement, policies implemented, and recommendations on changes in strategies and policies to greatly improve the education sector in the next twenty years.

My comments are limited to a few areas where I feel the author might have expanded his analysis or placed greater emphasis.

The author correctly points out that there is an apparent disconnect between the official statistics and reality. For example, the official pronouncements that the gross enrollment in primary education has reached 97%, or that the gender gap has been largely eliminated, or adult literacy rates have reached 64%, are overly optimistic. The best evidence indicates that even though progress has been made in each of these areas, there is much work that remains. To put this differently, even though Bangladesh has made considerable progress in the education sector, pleasantly surprising many in the international development community, the official statistics cannot be the sole basis of an impartial analysis of these achievements.

Considerable challenges remain before Bangladesh to achieve its true potential in the education sector. As the author states, education is a critically important sector in national development. There is no other sector that has greater potential for making a dent on systemic poverty and for permanently uplifting a large number of people from poverty to the middle class. I agree with the author that investment in education must be raised substantially from the current levels. The government must get its priorities right on this issue. For example, instead of adding more funds to the defense budget, Bangladesh should invest in the youth to be successful in the 21st century global economy since the returns on education ("education premium") has continued to rise. The information economy requires "knowledge" workers, and Bangladesh can only succeed in taking advantage of its most abundant resource – people with great work ethics – if it invests heavily in education. As a result, the next generation will be more productive and in greater demand in the world market as professionals with computer and English language skills, as opposed to being unskilled workers. Bangladesh has much to learn from its neighbor India and other successful nations in South Asia such as Malaysia and now China, where education has been made a national priority with emphasis on access and quality. It would have helped if the author had provided a few comparative statistics on the percentage of national budget devoted to education across the globe, especially the East Asian "tiger economies" that have experienced spectacular development in recent decades, thanks to their large investments in what economists call "human capital." When the author tells us that the proportion of the national budget devoted to education should be doubled, it would be useful to know where the increase should come from. In other words, as an economist might say the policy makers have to decide on the national production possibility curve and determine the appropriate combination, given the choice between "more schools or more tanks."

The author correctly describes the problem of language education. The move away from English in the post liberation era has been identified as a folly that has put the nation behind in taking advantage of the global economy. According to some experts, India has done so well in attracting foreign direct investment precisely because its high school and college graduates are reasonably proficient in English, the dominant language for global commerce and the Internet. The emphasis on English does not have to come at the cost of reduced emphasis on Bengali education – the recommendation that every student whether in the public or the expensive private school should be required instruction in the mother tongue is sensible. Children have a unique ability to learn more than one language (as we know from nations in Europe) and a proficiency in a foreign language gives a child great advantage in the long run.

There is not enough discussion of education in science, math and technology. As Professor Iqbal Mahmud states in a recent paper in this journal, Bangladesh needs to emphasize science and math learning in order to do well in the global high tech economy. Such education is the backbone of modern information and communications technology. This requires heavy investment in ensuring proper infrastructure and in closing the digital divide – the access to broadband connection for Internet use. Bangladesh should join developing nations such as Brazil that are adopting new technologies such as the $100 laptop for the children in schools. One cannot overemphasize the significance of access to the

Commentary

James H. Williams

As an outsider, one has to respect the evidence, experience, knowledge and analysis that Manzoor Ahmed, as insider, brings to this forum. Bangladesh, known for its learning, its poetry and literature, its respect for education and humane ideals, and its vibrant culture of social entrepreneurship, is struggling to educate all of its people in line with those ideals. It is a truism that people are the primary resource of Bangladesh. Whether they lead economic and social development, or serve as a drain on its resources depends, in substantial part, on the resolution of issues Professor Ahmed so compellingly raises in this paper. Bangladesh must find a better way to develop and utilize its people if it is to prosper.

The paper lays out an ambitious vision for education and human development for the next two decades up to 2025. This vision is grounded in a series of analyses of the education sector, independent studies, the PRSP document, and reports from donor-supported education projects, as well as the author's own expertise and experience. Building a broader consensus on such a vision is an essential step in bringing it into being. Ahmed suggests the convening of a group of "distinguished and committed" citizens to lead the process, and this paper is a good starting point for such a dialogue.

The paper begins with a detailing of the status, successes and failures of the system. By and large, it is a sobering picture. Though initial primary school enrollment approaches universality, nearly half the students who begin school drop out before completing the five-year primary cycle. Secondary school enrollment remains low at 45%, with a curriculum oriented toward tertiary education, which enrolls only 5% of the relevant age group. There is little educational provision of training for work for the vast majority of students who will not take part in higher education. Adult literacy rates are low, with estimates ranging from 64% on the part of government, to independent estimates of 42%. Most enrollment and educational participation data are weak and there is little or no information on what most graduates of the system have or have not learned. Thus even at the most basic levels, the system is not doing sufficiently well to meet the needs of a nation that depends for its livelihood and well being on its human resources. Indeed, Bangladesh is not currently on target to achieve the Millennium Development Goals (MDG) for primary education in 2015. The MDGs, while a necessary step in the right direction, are not, as Ahmed points out, adequate for sufficient progress in human development. Through "decades of neglect," the system has muddled through, with mere "patchwork" of change since colonial times, an "accumulation of problems which have become deep-rooted and intractable."

Resolution requires a vision, consensus on goals, specification of objectives and strategies, and process. Ahmed's paper provides a good draft, an ambitious set of goals and objectives and hints toward processes for reaching those goals. Politically, resolution of these issues requires a substantial political will, the willingness and wherewithal to change, as necessary to reach the vision, the "culture" of existing educational institutions. Also entailed is a willingness and capacity to try new things, to learn from their successes and failures, and to be wrong in the process of learning what's right. Ahmed's comprehensive and ambitious vision is discussed in terms of six major policy areas: improvements in quality, restructuring of the system for equitable access, English-Bangla bilingualism, ICT strategy, governance and management, and a sufficiency of resources effectively utilized. Some aspects of the vision are more thoroughly fleshed out than others. Access, for example, is more thoroughly detailed than ICTs. (This makes sense, as more is known about the dimensions and needed strategies for dealing with access.) Still the whole represents an important distillation of the status, needs and possible future direction of education in Bangladesh.

Current Limitations of Bangladesh's Education System

In detailing goals, objectives, strategies and challenges, the paper paints a vivid picture of the current system, some general points of which are noted here:

Lack of Effective Participation in Education

As noted, Bangladesh is not on target to achieve the MDGs by 2015, even though reaching them would not be a sufficient achievement to meet Bangladesh's human resource needs. Laudable as the goal of gender equality is, for example, simply achieving gender quality would leave many children out of school. Even as educational participation rates are

too low, data systems are insufficiently developed to track progress. Moreover, current efforts, Ahmed points out, focus too little on particular populations, whose needs may differ from those of the general population. The government's leading educational improvement initiative, the Primary Education Development Programme II (PEDP II), works only with the government and non-registered formal primary schools, leaving out the 20% children in other kinds of schools, the 10%+ of children who have never enrolled, and the 40+ percent who have dropped out. (Included in these other kinds of schools are a substantial number of non-formal primary schools aimed at the poor whose children have performed better on average than children in the formal system.) In such a context, initial primary enrollment rates are of limited use in gauging success: Better would be to define measures of "effective participation."

Failure to Impart Needed Learning Competencies

Much as enrollment is ultimately less useful than completion, Ahmed argues that educational improvement efforts must be evaluated in the final analysis by the extent to which they contribute to student learning. Theoretically simple, the notion is more difficult to put in practice. As Ahmed points out, the system currently lacks the means to assess the competencies students do acquire. It is not known, on a system-wide basis, what students are or are not learning. Arguably as important as the content of knowledge acquired is the manner by which knowledge is conveyed and acquired. Effective participation in the global economy will require that students acquire information skills more sophisticated than the "rote memorization of texts" currently required by examinations. Secondary education, Ahmed usefully notes, serves primarily to screen for higher education, which for the foreseeable future most students will be unable to attend. Yet there is no alternative provision of training students for anything else.

Limited Governance, Management, and Technical Capacity

The system is "administrative" in focus rather than managerial. Lacking a guiding vision and the technical expertise and habits of responding to changing needs and conditions, the education system relies largely on regulations and practices grounded in tradition, custom, and precedence, rather than data and strategic vision. Available data are rarely used for decision making. The technical capacities of the governing ministry and directorate are limited, and institutional memory short, as civil servants are transferred in and out of the sector without regard for sectoral expertise. In this sense, the system is always starting over. There are few if any national institutions on which the government relies for expertise. To a substantial extent, informed analysis of the system is carried out by external funding agencies, while management of the system is handled bureaucratically. Ahmed suggests greater system-wide articulation and coordination, a consensually-derived vision of the system, enactment of a comprehensive law of education, and creation of policy-making and coordinating structures outside the day-to-day administration of the system, but including representatives from the larger society as well as government. He suggests several ways in which a thoughtful process of decentralization might be initiated. He notes the negative role of partisan politics and suggests several ways they might be minimized.

A Pro-Rich not a Pro-Poor System

Given the larger inequalities of society, the benefits of education accrue to the better off, who are also positioned to take advantage of opportunities the poor cannot afford. In many ways, the current education system is effectively pro-rich rather than pro-poor. Despite official policies to the contrary, schooling is not free of cost to families. Ahmed cites research showing that families contribute roughly the same amounts as government to the education of their children. Under-resourced as a percentage of GDP and as a proportion of government expenditures, the education system is "low cost and low-yield." Salaries comprise 97% of the recurrent primary education budget, leaving virtually no resources in the regular budget to enable and support instruction, through, for example, supervision, learning materials, upgrading of teacher skills, and so forth. Often, support for such items is provided on an ad hoc basis through externally-assisted development projects. The low quality of schools further discourages learning. Primary-level stipends to stimulate demand make up two-thirds of the government's own development budget allocation and one third of the total primary sector development program budget. Ahmed wonders whether the funds might not be better spent providing a rich learning environment for students rather than encouraging children to attend under-resourced schools where learning is difficult. Experience from BRAC's non-formal primary education program suggests that children will attend

school and learn if provided with a suitable curriculum and learning environment. BRAC's schools' are roughly the same cost as government schools. In these ways, when the system fails to support student learning, it is the poor who suffer, as "the rich and the elite can opt out of the system and go to private institutions or abroad, as many have."

Macro-Changes in Provisional Strategy

In addition to articulating a comprehensive overall vision and specifying particular needs, Ahmed raises questions, mostly implicitly, about the provision of education. Here I note a few.

Who is responsible for education?

Implicit in the paper is a much broader and richer conception of responsibility for envisioning, supporting, carrying out, monitoring, and reforming/revising education than is currently in place. At present, virtually all of that responsibility for education lies with the government, specifically the central administrative bodies responsible for education, who lack the financial, managerial, and technical capacity for such an immense task. Even in the most well-resourced and capable systems, governmental administrative bodies are never fully responsible for education. Whether acknowledged and coordinated or not, parents, communities, and organizations in civil society already support education through moral support, the provision of children, assumption of direct and indirect costs of education, and the payment of taxes. At present, parents do play a role, as do communities and NGOs, but the roles are, at best, loosely articulated with the efforts of government. Often they are ignored by the authorities.

Implicit in Ahmed's recommendations is that the responsibilities for education be acknowledged, coordinated and shared, between central government, its district and local units, parents, community members, NGOs, and consultative groups of wise citizens yet to be constituted. NGOs and madrassas, for example, are already providing up to 20% of the primary education in the country, and yet they "operate with differing learning objectives and academic standards, with little opportunity for horizontal movement of students, and no interaction among organizational authorities running these different streams." Some NGOs have found ways to reach particularly disadvantaged populations, with higher levels of learning, at comparable costs, yet the system has not found a way to learn from such experience. Lacking a vision, the system must rely on precedent and procedure. Ahmed would likely center the ultimate responsibility and accountability for education at the local level, among parents, community members, teachers and school leaders, local education officials, and agents of civil society. In these ways, Ahmed challenges the capture of education by the government bureaucracy, who in the event, are overwhelmed by the task, lacking the resources and capacity to manage it all. He suggests several concrete ways in which decentralization might be started.

Where should the system focus?

Similarly, the paper implies a shift in the focus of the system, away from a focus on accounting for provision, regulation, and supply by central officials to provision of support to classroom instruction and evaluation of activities in light of learning outcomes at the school level. Such a shift would require a major decentralization in thinking as well as in planning and effort. The school and community would need capacity development. The center would need to redefine its role, away from implementer and controller of all initiatives to coordinator. Central government could still maintain control through specification of outcomes, standards and targets, but could leave more of the details of implementation to implementers. The shift is somewhat analogous to the shift in teachers' role from the source of all knowledge and learning in a "teacher-centered" pedagogy (where the focus is largely dependent on the teacher's expertise and initiative), to that of coordinator and facilitator of learning in "child-centered" pedagogy, where the focus is on children's acquisition of desired competencies. Ultimately, such a system should be cheaper and more sustainable, as implementation decisions are made closer to the source of information about conditions at the critical event of the system, classroom learning. Sustainability and accountability should be enhanced as the burden of implementation is shared with those with the greatest vested interest in success.
Ahmed challenges the system to trust local stakeholders and to help them learn to manage their schools.

How does the system think?

Given the technical limitations of system governors, thought needs to be given, Ahmed's document subtly implies, to how the system can be enabled to think.

Relying primarily at present on external funding agencies for technical expertise, the system would be greatly enhanced by a systematic and sustained effort to enhance the professionalism and technical capacity of system managers. Many system managers lack technical expertise in education, the development of which is hampered, along with institutional memory, by civil service transfer policies. Unlike other systems, Bangladesh does not—but could—utilize universities, think tanks, even NGOs, to help analyze the status of the system; examine particular problems; develop remedial strategies; design and evaluate experimental pilot projects; and carry out the kind of systemic and sector-wide planning that Ahmed calls for.

Also implicit in the paper is the importance of learning how to achieve the system's goals. Rather than rely solely on a central design and across-the-board implementation process, Ahmed suggests a more experimental approach, by which innovations are tried in local contexts, lessons learned and refined, and thoughtfully taken to scale, mindful of local conditions. Rather than one size fits all, Ahmed proposes the targeting of particular groups and conditions where those differ significantly from the mainstream. Such targeting requires careful attention to salient variations across locale, monitoring and analysis of local "experiments," as well as permission to carry them out in the first place.

Technical expertise is useful in informing the larger policy decisions, made ideally under a comprehensive education law devised in accordance with the country's current aspirations and situation, and under the guidance of a consultative body of representatives from the larger society and government's education managers. The paper usefully cites examples of such laws and consultative bodies in Bangladesh's neighbors.

How to realize the vision?

In large part, there is clarity about what needs to be done. What we don't know is how to do it under current conditions. Research has shown for several decades that a plan is a necessary but insufficient condition for change. Organizational wherewithal is partially a function of capacity and good ideas, but equally a function of organizational culture and political will. For historical reasons, Bangladesh's education system is not, at present, outcome-oriented, decentralized, or sufficiently professionalized. Organizationally, it is not, at present, vision-oriented or experimental. It is not at present particularly open to change or to broader participation.

The challenge will be to find ways, large and small, from both within the government and outside, to move in the desired directions. Some of this can come from outside, through negotiations between funding agencies and the government, or from the voices of civil society and the academy. Some can come from within the system by civil servants and leaders who share the vision. Some can emerge opportunistically, in response to openings in dialogue.

The vision and the recommendations are necessary and important. Now the need is to find creative ways to move the system, complex and naturally resistant as are all large organizations operating under difficult conditions, toward the attitudes, structures and resources named here to educate all of Bangladesh's people. This will require policy entrepreneurs inside and out.

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Farmers' Willingness to Pay for Irrigation Water Under Government Managed Small Scale Irrigation Projects in Bangladesh

Sonia Akter

Abstract

The study attempts to determine the economic value of irrigation water in a government managed small scale irrigation project (GMSSIP) by eliciting farmers' willingness to pay (WTP) using contingent valuation method (CVM) in the form of single bounded closed ended WTP questions. Agricultural farmers in the study area, who currently largely depend on privately owned irrigation water supply, were asked for their preferences for a ground water based government managed irrigation water supply project in a small scale household survey. The estimated WTP for use of irrigation water from GMSSIP equals to Taka 1670 (US$ 23.85) per thirty decimal of land per cropping season, which is 12 percent of the average agricultural income of household per cropping season. Comparing estimated WTP for water in an existing government managed irrigation project, the study argues that ground water irrigation water is highly under-priced in Bangladesh. Furthermore, the study reveals that bid level, respondents' age, education, family size, number of income sources, ownership of farm land, management system of current irrigation scheme and decision to change cropping patterns if a government managed irrigation scheme is provided, have significant influence on farmers' WTP for GMSSIP. Based on the empirical findings, the study strongly advocates water policy reform in the agricultural sector in order to enhance efficiency and promote sustainability in water use.

Introduction

Bangladesh is an agricultural country with an area of only 144,000 km^2 where 132 million people live. The country receives intensive amount of rain water in the monsoon months (June - October) and suffers from water shortage during the dry season (November - April). The average annual rainfall is 2,300 ml which varies from 1200 ml in the west to 5800 ml in the northeast. Agriculture is the major water consumer sector in the economy which consumes approximately 80% of the total water. Groundwater is the major source of irrigation water during the dry season complemented by an abundant supply of rain water during the wet season. In order to achieve food self-sufficiency for an ever-growing population, the government invested an extensive amount of money in 'Flood Control Drainage and Irrigation (FCDI)' projects and ground water based small scale irrigation schemes. The major objective of these FCDI and small scale ground water based irrigation projects is to ensure water availability for Boro crop during the dry season. Under the existing system, non-volumetric price is charged for the use of irrigation water. Conceptually non-volumetric pricing refers to a pricing structure where water is billed in proportion to something other than the volume of water used (e.g., area irrigated or weight of crop produced). Water price is charged mainly based on the size of crop land and crop type. The price charged under government managed projects for supplying irrigation water is too low to affect farmers' cropping decision with a lower rate of collection.

Agricultural water pricing plays a significant role in promoting water use efficiency and cost recovery. Moreover, in a developing country like Bangladesh, appropriate pricing of irrigation is important for two reasons. First, widespread and increasing practice of Boro crop cultivation throughout the country during dry season creates enormous demand for groundwater. Failure to determine appropriate water price may lead to over utilization and over extraction of groundwater which will eventually cause a permanent decrease of the groundwater table. Secondly, irrigation water sector in Bangladesh is heavily subsidized and claim about 50% of development expenditure in the agricultural sector. In order to extend the irrigated area under government managed irrigation scheme without putting further pressure on the country's development budget, it is important that farmers' participation is ensured through appropriate charge for water.

The present study aims to contribute to agricultural water policy reform in order to enhance efficiency and to promote sustainability in water use. The study attempts to determine the price of irrigation water eliciting farmers' willingness to pay (WTP) in a government managed small scale irrigation project (GMSSIP) using contingent valuation method (CVM). Agricultural farmers in the study area, who currently largely depend on privately owned irrigation water supply, were asked to pay for use of irrigation water under GMSSIP in the study area. The estimated WTP for use of irrigation water equals to Taka 1670 (US$ 23.85) for per kani (thirty decimal) land per

cropping season which is 12 percent of the average agricultural income of household per cropping season. Furthermore, the study reveals that bid level, respondents' age, education level, family size, number of income sources, ownership of farm land, management system of current irrigation scheme and decision of changing crop if government managed irrigation scheme is provided have significant influence on farmers' willingness to pay for GMSSIP.

The rest of the paper is organized as follows. Section 2 discusses the relevant literature on CVM. Section 3 outlines the conceptual framework of the study. The fourth section gives a description of the case study area followed by a description of the general survey and sample characteristics in Section 5. General WTP results and output from the regression analysis are presented in section 6 followed by the conclusions and recommendations from the study in section 7.

Literature Review

No previous study has been carried out in Bangladesh to estimate the economic value of irrigation water using either market or non-market based valuation techniques. However, the issue of low water price and poor collection rate in large scale irrigation water projects has been addressed in several studies (Chakravorty, 2003; Hussain and Wijerathna, 2004). Hussain and Wijerathna (2004) demonstrate that the average water price charged in large scale irrigation water projects varies within the range of US$16-18 with an extremely poor collection rate of 5-15%. A report published by the Water Ministry of Bangladesh (2000) also indicates a very poor water price collection rate (3 to 10 percent) and concludes that cost recovery in such intensive infrastructure based irrigation projects is very poor.

The existing literature on irrigation water valuation provides few evidences where contingent valuation method has been applied to determine the true economic value of irrigation water. Tiwari (1998) reviewed the current issues in irrigation water pricing and presents a conceptual framework for economic valuation of irrigation water and provided the results of a case study on determining the economic value of irrigation water using both stated and revealed preference valuation techniques. The results indicated that farmers are willing to pay sums at least equal to the operation and maintenance cost and are able to pay up to the marginal value product of water. The maximum willingness to pay was found to be considerably less than the opportunity cost of irrigation water, indicating the unsustainable use of irrigation water at present. Tiwari used both the open and closed-ended questions. Closed ended WTP have been found to be related to respondents' gender, agricultural income, perceived water sufficiency, education, family size and landholding. On the other hand, variation in open- ended WTP was found significantly varying with the farmers' attitude towards paying fee, sex, education, migrating family members, family size and access to credit.

Another contingent valuation survey carried out by Giorgis (2004) in Ethiopia in the form of open ended WTP question for irrigation water revealed that access to credit create an opportunity for respondents to invest in necessary agricultural inputs, of which irrigation water is one. Thus those who tend to borrow are willing to pay more for irrigation water. Other variables that significantly influence farmers' willingness to pay for irrigation water are the respondent's education, quantity of fertilizer used in the preceding crop season, total revenue earned in the preceding crop year, the respondent's age, experience with irrigation and the size of cultivable land. Mallios and Latinopoulos (2005) used contingent valuation method in the form of closed ended WTP question to determine the factors contributing to WTP for irrigation water in Northern Greece. The study revealed that respondents' age, family size, number of family members working in agriculture, number of total boreholes in use, amount of annual irrigation water consumption and the nature of water shortage have a significant impact on farmers' willingness to pay for irrigation water.

Analytical Framework of the Study

The theoretical model of the study is based on standard microeconomic principles and empirical work cited in the literature review section. Theoretically, compensating variation or WTP for a program is known as the amount of payment by a consumer such that the utility after provision of the good or service remains the same as in the base case (without the program). Willingness to pay is an amount that compensates utility loss due to reduction in income by an improvement in the good or service in question and leaves the household on the same indifference curve. The existing literature on economic valuation of irrigation water indicates that farmers' WTP for irrigation water supply depends on income, socio-economic demographic characteristics (i.e. age, family size, education) and firming characteristics (i.e. size of crop land, amount of fertilizer use, experience with irrigation water). Based on the theoretical context of WTP outlined above and empirical findings on irrigation water valuation studies, the analytical framework of the

current study addresses the following constructs.

Let existing privatized irrigation water supply scheme be denoted by q^0 and the proposed government managed irrigation water providing scheme be denoted by q^1. The utility functions associated with the existing private irrigation water supply system and hypothetical GMSSIP can be written in the following form:

Existing Private Water Supply Scheme:

$$U^0 = v^0 (q^0, I, F, S, e_0) \quad (1)$$

Hypothetical GMSSIP:

$$U^1 = v^1(q^1, I\text{-}M, F, S, e_1) \quad (2)$$

[e_0 and e_1 in equation 1 and 2 are the error terms distributed normally with mean zero and variance 1]

'I' denote yearly average household income; F stands for farming characteristics and S stands socio-economic characteristics of the respondent /household. 'M' is the WTP (money amount household is willing to trade off) for hypothetical GMSSIP. Farmer's decision of paying money for GMSSIP depends on the utility obtained from existing water supply scheme and variation in income level for attaining the hypothetical source. Respondent/household will agree to pay for irrigation water under GMSSIP if:

$$v^1(q^1, I\text{-}M, F, S, e_1) > v^0 (q^0, I, F, S, e_0)$$

Thus, WTP for irrigation water under hypothetical GMSSIP will satisfy the following equality:

$$v^0 (q^0, I, F, S, e_0) = v^1(q^1, I\text{-}M, F, S, e_1)$$

A dichotomous choice framework is the most common and popular form of CVM that is generally used for the type of valuation study depicted above. Logistic probability model is most commonly used to analyze dichotomous choice contingent valuation data. ,.The reduced form of a typical logistic probability model can be written in the following form:

$$\Pr[y_{i=1}] = \frac{e^{\beta' x}}{1 + e^{\beta' x}} \quad (3)$$

Where, prob [y_i=1] is the probability that a respondent says 'yes' to a specific bid amount. Beta (β) is a vector of variable parameters to be estimated, while x is the corresponding vector of explanatory variables. The error terms of the logit model are assumed to be normally distributed with zero mean and variance of one. The responses of the closed-ended WTP format question are recoded as 1 and 0 respectively for acceptance and rejection of bid values. This binary dependent variable is then modeled in respect of the bid amount plus other explanatory variables. Therefore, the statistical model of the current study can be expressed as:

$$\Pr[y_{i=1}] = \frac{e^{\beta_0 + \beta_1 BID + \beta_2 INC + \sum_{i=1}^{n} \lambda_i S_i + \sum_{j=1}^{m} \delta_j F_j}}{1 + e^{\beta_0 + \beta_1 BID + \beta_2 INC + \sum_{i=1}^{n} \lambda_i S_i + \sum_{j=1}^{m} \delta_j F_j}} \quad (4)$$

where,

(i) BID=bid level (taka per season per kani)
(ii) INC= yearly household income
(iii) S= Socio-economic and demographic characteristics
(iv) F= Firming Characteristics

Case Study Area

To capture the explanatory power of the different variables (discussed in the analytical framework section of the paper) on variation of estimated WTP, primary data need to be obtained from a representative sample using a fully structured questionnaire survey. However, the financial support available for the study was inadequate to conduct a large survey. As a result, the survey for the current study was limited to a case study in a fairly typical sub-district in Bangladesh known as Homna. The study site was selected based on information collected through a series of key informant interviews with the Director of Flood Forecasting and Warning Center in Bangladesh Water Development Board, officials at the Climate Change Cell in the Department of Environment, the Government of Bangladesh and policy planners in the Water Resource Planning Organisation (WARPO) and economists at Centre for Environmental and Geographic Information System (CEGIS).

The case study area (Nilakhi Union of Homna sub-district) is located in the south-east of Bangladesh in the district of Comilla. The area is approximately 70 km away from the Capital. The total land area of the study site is approximately 20,000 hectares and the resident population is 2, 56,052 (Population Census 2001). Table1 presents detailed characteristics of the study site. The geographical location of the case study area is presented in Map-1. Nilakhi Union is situated at the centre of the sub-district Homna. The survey was carried out in three villages of this union.

Major economic activity of this area is crop cultivation. Rice is the major agricultural crop. Other crops include jute, wheat, potato, mustard seed, onion, garlic, sesame, chilli and musuri (pulse). The total land area under cultivation equals to 16,700 hectares which is almost 80 percent of the total land area. The irrigated land covers an area of 7,730 hectares which accounts for 46 percent of the total cultivated land where the sole water source is locally pumped groundwater through shallow tube wells. The area is one of the food deficit areas in the region mainly as a result of water shortage for dry season agricultural activity. Farmers in this area largely depend on privately managed irrigation water supply for dry season crop growing which is highly inadequate compared to the demand. The demand for irrigation reaches its peak during the dry season for cultivation of Boro (HYV) paddy which requires a large amount of water supply. As a result, adequate supply of irrigation water during the dry season in the study area is considered as an important factor that influences food production.

Survey and Sample Characteristics

Survey Set-Up and Sampling Procedure

The target groups of the present survey were all categories of agricultural farmers; large, medium, small, and landless. Local interviewers, both male and female, carried out 300 face to face interviews using a fully structured household questionnaire in the second week of April 2006. The interviewers were carefully selected and thoroughly trained. They were also used for pre-testing of the questionnaire. The sample size was 10 percent of the total farm households (approximately 3,000) in Nilakhi union and 1 percent of the farm households (28,000) in the sub-district. The selection of households in each village followed a systematic random sampling method where every fifth household located along the right side of the main village road was interviewed. Only the head of the households (all male) were interviewed in this survey. Each interview lasted, on average, 15-20 minutes.

The questionnaire was designed on the basis of the overall conceptual framework of the contingent valuation method. The Questionnaire used in the survey included four sections, (i) socio-demographic characteristics (age, occupation, educational background, family size, sources of income, standard of living), (ii) type and scale of agricultural farming (how big is the cropland, height of the crop land, types of crops, cost of production), (iii) present source and nature of irrigation water (cost per unit, types of ownership, major advantages and disadvantages of the present irrigation water source) and (iv) WTP for irrigation water under the hypothetical GMSSIP. Farmers were offered a hypothetical GMSSIP in the following form:

> Government wants to bring this area (union) under central and extensive small scale irrigation water management system. If the scheme is implemented, every single village of this area will receive irrigation water all year round. Irrigation water will be extracted through deep tube well and will be carried to your farmland by underground pipelines.

After introducing the hypothetical product (GMSSIP), respondents were asked two 'willingness to pay' (WTP) questions. First, respondents were asked whether they were willing to pay 'in principle' for use of irrigation water per kani (thirty decimal of agricultural land) per season (cropping season consists of four months) under the GMSSIP. Those who said 'yes' were subsequently asked in the form of a dichotomous choice question whether or not they were willing to pay a specific bid amount. Eight different bid levels ranging from 500 (US$7.14) to 2500 (US$35.71) Taka/kani/season were used. In order to avoid 'payment vehicle bias', local and usual system of payment for irrigation water was used so that the farmers could understand the offered bid and formulate their answers easily. Furthermore, to avoid starting point bias, inherent to contingent valuation studies, pilot survey was carried out on a small group of 50 respondents of the same WTP question in an open-ended format. Taking into account the information obtained in the pilot survey, these bid amounts were selected and were randomly allocated among respondents.

Sample Characteristics

A summary of socio-economic and demographic variables of sample respondents is presented in Table 2. The table compares the key characteristics of the sample with the available national statistics to understand how representative is the sample of the overall population. In view of the fact that the current study includes only agricultural farm households, the matching of the sample key characteristics with the national population characteristics is not plausible. Although the comparison among the key socio-economic and demographic characteristics between current sample and national statistics presented in Table-2 does not indicate a 100 percent match, a fairly reasonable amount of representativeness is evident.

Of the three hundred respondents interviewed, the average household consisted of about seven family members. The average age of the respondent was around 45 years. A majority (96 percent) of the households interviewed was Muslims and the rest were Hindus. Half of the household heads interviewed during the survey were illiterate. Almost all respondents were the heads of their households and owned the houses they lived in. The majority of the houses were made of tin (both roof and walls) and a water-sealed latrine were the most common type of sanitary facility in the dwellings. Almost all of the households had electricity. Tube-well was one of the most common sources of drinking water for sample households. Leaves and cow dung were the main sources of energy.

Two thirds of the agricultural farmers interviewed were engaged in a secondary occupation, mainly trading or day laborer. The average annual household income was about 90,000 Taka (US$ 1373), while half the households had per capita income per month of Taka 1005 (US$ 15) which is slightly higher than the national per capita average rural income which is Taka 924 (USD 14) (HIES 2003). A majority of 80 percent of the farmers owned the land they cultivated. Around one third (38 percent) of the farmers included in the sample could be categorized as landless (owning less than 0.5 hectares of land) while the other two thirds could be categorized as marginal, small and medium farmers (average land holding ranged between 0.5 to less than 7.49 hectare)[1]. The majority of the farmers interviewed grew Boro crop in their farmland during the dry season. The farmers used irrigation water in their farmland mostly during dry season to grow Boro crop. Privately owned deep and shallow tube wells were the major sources of irrigation water supply. The majority (55 percent) of the respondents indicated a shortage of water during the dry season as the main problem with existing irrigation system, followed by problems such as 'current irrigation price being too high (15 percent)', 'irrigation pumps consumed too much electricity (15 percent)', and 'irrigation pumps got out of order sometimes (13 percent)'. More than two thirds (78 percent) of the respondents believed that a central irrigation system in the study area would solve the problem of irrigation water availability.

Contingent Valuation of Irrigation Water

WTP Results

A majority of the farmers (84 percent) replied positively to the first WTP question (WTP in principle). 43 respondents (14 percent of the sample) refused to pay in principle for use of irrigation water under GMSSIP. Those who were not willing to pay were subsequently asked in a follow up question as to why they would not do so. The most heard reason for not willing to pay was 'I do not have financial ability to pay money for irrigation water (income constraint, 78 percent), followed by reasons such as 'I do not use irrigation water' (2.4 percent), 'Large land owners should pay' (2.4 percent), and 'I do not think my money will be used properly' (2.4 percent). Respondents who refused to pay because of the reason 'I do not believe that my money will be used properly' are known as protest bidders in Contingent Valuation (CV) surveys. Protest bidders comprise less than 1 percent of the total sample.

The study obtained 257 valid observations from the second WTP question for GMSSIP. A (parametric) logistic probability model (described in Section 3) is used to estimate central tendency measures of WTP (Hanemann 1984; Gujarati 2005). The estimated WTP result is presented in Table 3. Estimation of a parametric logistic probability model reveals a mean WTP of Taka 1670 per kani (30 decimal land) per season (four months) for irrigation water which is 12 percent of average agricultural income of household per cropping season[2]. The average estimated WTP is higher than the current price level in an existing Government managed irrigation scheme. In the Borendro Development Organization, farmers pay Taka 85 for per hour irrigation water in their farm land. After estimating the total demand for water during the dry season for per kani (30 decimal farm land), the price paid by the farmers for use of irrigation water sums up to Taka 850 (USD 13)[3]. For a 10 percent confidence interval, the average irrigation water price paid by the farmers in the existing irrigation water project ranges between Taka 765 (US$10.9) to Taka 935 (US$13) which is substantially lower than what farmers are willing to pay in a hypothetical government managed irrigation water supply project.

Factors Explaining WTP for Irrigation Water

Stated WTP responses (n=257) are checked for determining factors. A stepwise backward binary multivariate logistic regression model (described in Section 3 equation 4) was estimated using various different firming and socio-demographic characteristics. However, the variables that have significant impact on farmer's willingness to pay for irrigation water under GMSSIP are the following:

(i) BID=bid level (taka per season per kani)
(ii) AGE=respondent's age

(iii) EDUC=respondents education level (primary school and higher=1, otherwise=0)
(iv) F_MEM=total members of the family.
(v) S_INC=number of income sources
(vi) OWN_LAND=ownership of farm land (respondents who own the land that they grow crop=1, otherwise=0)
(vii) OWN_IRRI=management system of current irrigation scheme (self managed=1, otherwise=0)
(viii) CROP_CHANGE=decision of changing crop if central irrigation system is provided (cropping decision will change=1, otherwise=0)

Table 4 summarizes the results of the estimated regression model. The model turned out to be significant at less than one percent level (see Table 4 for likelihood ratio test) which implies that the model (as a whole) is significantly different from the one with constants only. The regression model has predictive ability higher than 63%. The Wald test statistics (commonly used to test significance of individual logistic regression coefficients) turned out to be significant at less than five percent level for each independent variable.

As expected, the bid (BID) variable has significant and negative coefficient which indicates that the likelihood of accepting an offered bid amount increases as the bid amount goes down and vice versa. The variable 'AGE', as expected, has significant impact on variation in WTP for irrigation water under GMSSIP. This finding is highly consistent with the evidences provided by empirical literature. The positive sign of the coefficient of AGE variable implies, on an average and ceteris paribus, the older the farmer is the higher is the likelihood of accepting an offered bid level for secured supply of irrigation water round the year. This may be because the old farmers have more experience of water scarcity during dry season than younger farmers in the region and therefore, the likelihood of accepting a bid amount varies positively with age.

'Respondent's education level' (the variable EDUC) has a significant positive impact on the likelihood of accepting an offered bid amount for GMSSIP. This result is also consistent with theoretical expectation and empirical findings. Farmers who have completed at least primary school education exhibited higher likelihood of accepting an offered bid amount than illiterate farmers. This result indicates the universal fact that education enhances the awareness in value of scare environmental resources such as water. As expected, a positive relationship has been found between family size and likelihood of accepting offered bid amount for irrigation water under GMSSIP. The larger the family size, the greater is the food demand. Therefore, secured supply of irrigation water is more important for large households compared to small households.

Unlike the existing literature on contingent valuation of irrigation water, the current study failed to find any significant relationship of income with willingness to pay for irrigation water. The INC variable was dropped from the model during the backward estimation process. This is because of positive correlation of household income with a large number of explanatory variables in the model, i.e. INC (income) –EDUC (education), INC (income)-OWN_LAND (land ownership) and INC (income)-OWN_IRRI (ownership of water pump). The explanatory variable 'number of income sources (S_INCOME)' was created as a proxy to check the influence of household income on likelihood of accepting offered bid value as S_INCOME has been found to have a high positive correlation with yearly household income ($r=0.41$; $p<0.01$). This implies that households with higher income sources earn a significantly higher absolute income. The proxy variable S_INCOME turns out to be statistically significant with theoretically expected sign (positive).

Other than the household characteristics, the study illustrates some farming characteristics that influence likelihood of accepting an offered bid amount for irrigation water under GMSSIP. The ownership of farm land (OWN_LAND), as expected, had a positive sign. This implies that farmers who own the land that they cultivate are more likely to accept an offered bid amount. Furthermore, management system of current irrigation supply has been found to have a significant impact on farmers' WTP for irrigation water under GMSSIP. Farmers who own water pumps are less likely to accept the offered bid compared to farmers who do not own a water pump. Finally, change in cropping decision (CHANGE_CROP) after implementation of GMSSIP has a significant impact on variation in stated WTP. Farmers who cultivate a less profitable crop due to shortage of irrigation water and intend to change cropping pattern if irrigation water is available, are more likely to accept the bid level offered than farmers who already have access to sufficient water supply to grow the crop that they want.

Discussion and Conclusion

The aim of the current study was to estimate farmers' WTP for irrigation water under government managed

small scale irrigation water supply projects and to determine the factors that influence the variation in WTP. In a small scale household survey, carried out in mid 2006 in a fairly typical agri-based rural economy in Bangladesh, three hundred agricultural farmers were asked for their preference to pay for a hypothetical GMSSIP.

The study reveals a WTP of Taka 1670 per kani (30 decimal of land) per season (four months) for irrigation water under GMSSIP which is almost 12 percent of the average agricultural income of households per cropping season and is substantially higher than water prices charged in the existing government managed irrigation water supply projects. The regression model shows that the explanatory variables can reveal and explain the attitudes of the target population. A multivariate logistic regression model has been estimated based on closed ended WTP values for irrigation water. Explanatory factors such as bid level, respondents' age, education level, family size, number of income sources, ownership of farm land, management system of current irrigation scheme, decision of changing crop if government managed irrigation scheme is provided, included in the model turned out to be statistically significant with theoretically expected sign. Unlike the other existing contingent valuation literature on irrigation water, this study does not show any significant direct impact of household income on respondents' willingness to pay. However, an indirect relationship with annual average household income with WTP is established through a correlation test on income variable with number of income sources in the model.

The study reveals that under existing pricing structure, farmers are charged much lower price than what they are willing to pay in a region where irrigation water is a scarce resource. As a result, one of the most important policy implications of the current study is that there is a possibility to restructure the existing irrigation pricing system by taking into account the true economic value of irrigation water in order to ensure longer term water use sustainability and cost recovery of public investment projects. The result of the current study, furthermore, implies that a basic level of education is a key criterion for reform to take place successfully as our study indicates that education enhances farmers' understanding of the true value of water. The study also indicates that the success of revised pricing largely depends on the land ownership structure of the region as landowners are more likely to pay higher prices for secured irrigation water supply than the landless farmers.

Finally, as a methodological note, I would like to mention that the current study presents merely a case study and therefore, the results of the study should not be generalized for the country as a whole. Due to limited financial support, a more extensive survey to ensure representativeness of the sample was beyond the scope of the current study. Nevertheless, the study provides some guidance towards future agricultural water pricing structure by pointing to the fact that there is a wide dispersion between the existing market price of water and its true economic value.

Table 1 **Characteristic of Study Site**

Study Site	Villages: Miras, Baherkandi, Kolakandi Union: Nilakhi, Sub-district: Homna District: Comilla
Area	20 sq km
Population	21156.3
Agriculture Household	3,000
Literacy Rate	21.9 percent
Religious Group	Muslim 93.46 percent, Hindu 6.32 percent and others 0.22 percent.
Main Crops	Paddy, jute, wheat, potato, mustard seed, onion, garlic, sesame, chilli and musuri (pulse).
Land Use	Total cultivable land 1361.30 hectares; Fallow land 2.4 hectares; Single crop 49.93percent, double crop 43.07percent and treble crop land 7percent. Land under irrigation 698.45 hectares.

Source: Comilla Agricultural Census 1996

Table 2 **Comparison of key socio-demographic sample characteristics with national statistics.**

Variable	Sample Average	National Statistics
Household Number	300	
Head of the household (%)	93	
Respondent's Sex (% of male)	99.9	
Religion (% of sample Muslim)	96	90.38
Respondents Age (in years)	45	42
Median monthly income per capita (US$)	US$ 15	US$ 14
Educational Qualification (% illiterate)	54.2	60.95
Average family size (no of person)	6.81	5.19
Electricity connection (%)	90	18
Type of Latrine Used (use of sanitary latrine in %)	23	20.59
Drinking water (use of tube well in %)	98	95.75

Source: Author's calculation based on survey data and HIES Report, 2003

Table 3 **Mean WTP for values based on linear-logistic model**

	WTP for use of irrigation water (Taka/per kani/per season)
Mean WTP[1]	1670
Standard error[2]	246
n	257

Notes:

[1] The formula to calculate mean and median WTP based on linear-logistic regression is:
E(WTP) = -a/b, where a is the estimated constant and b the estimated slope for the bid level.

[2] The standard error of mean WTP is calculated as follows:

$$s = \sqrt{\text{var}(-a/b)} = \left[\frac{1}{b^2}\left(\text{var}(a) + \left(\frac{a}{b}\right)^2 \text{var}(b) - 2\left(\frac{a}{b}\right)\text{cov}(a,b)\right)\right]^{1/2}$$ where a is again the estimated constant (intercept) and b the slope of the bid level.

Source: Author's calculation based on model

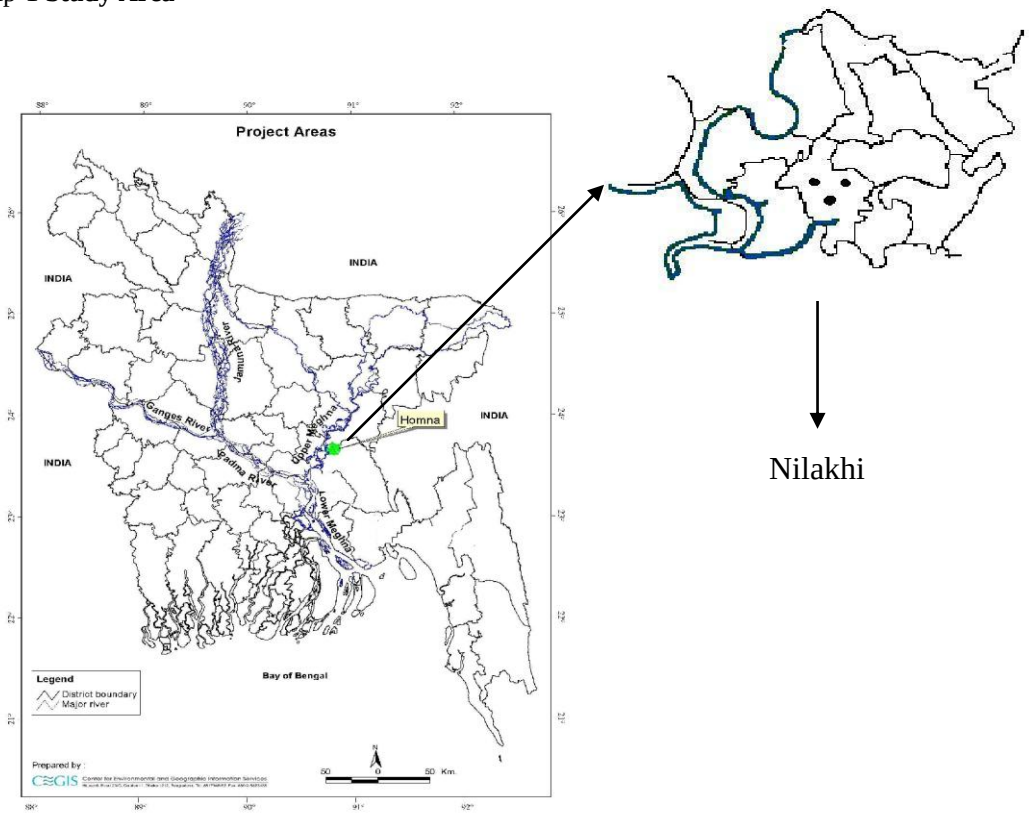
Table 4 **Estimated linear-logistic WTP model for Irrigation Water**

Variable name	Variable Description	Coefficient Values
BID	Bid level	-0.001*** (0.000)
Socio-economic and demographic characteristics		
AGE	Respondent's age	0.031* (0.019)
EDUC	Respondent's Education Level	0.993*** (0.414)
F_MEM	Number of Total Family Members	0.225** (0.089)
S_INC	Number of Income Sources	0.654*** (0.200)
Farming characteristics		
OWN_LAND	Ownership of farm land	1.858*** (0.709)
OWN_IRRI	Management System of Present Irrigation Scheme	-2.164*** (0.664)
CROP_CHANGE	Decision of Change in Crop	0.002*** (0.001)
CONSTANT	Constant	-3.886* (2.097)
-2 Log Likelihood		177.237
Chi-square		160.286 (8 d.f.; p<0.001)
Percentage correct predicted		63.4
Nagelkerke R-square		0.635
N		257

*p < 0.10; ** p < 0.05; *** p < 0.001

Source: Author's Calculation based on survey data.

Map-1 **Study Area**



ENDNOTES

1. Depending on the amount of land ownership, farms in Bangladesh are divided into five major categories. The categories are as follows:

Large farmer	7.5 acre and above
Medium farmer	2.5-7.49 acre
Small farmer	1.5-2.49 acre
Marginal farmer	0.5-1.49 acre
Land Less	0-0.49 acre

Source: Bangladesh Agricultural Census 1995

2. Yearly average agricultural income per household has been divided by 3 to calculate agricultural income per season.

3. In a 30 decimal farm land to cultivate BORO crop, farmers need to irrigate the land for approximately ten hours per season (over the period of ten weeks).

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Changes in Socio-economic and Environmental Situations in the Dalia Irrigation Project Area During 2000-2007: Policy Recommendations

M. Fakrul Islam
and
Wardatul Akmam

ABSTRACT

This paper addresses the socio-economic conditions and problems faced by farmers in the Dalia Irrigation Project area in the districts of Nilphamari and Lalmonirhat. Although the purpose of this huge project was to use the Teesta River water for irrigation in this region, farmers are still deprived of irrigation water in the dry season as there is insufficient water in the Teesta at Dalia point owing to the withdrawal of water at upstream Gazoldoba, in India. Research has been conducted on the optimal use of Teesta water for the basin as a whole and several recommendations have been made. Nevertheless, due to indifference of the Bangladesh authority and lack of interest of their counterpart (India), the Joint River Commission (JRC) could not make any effective/concrete decision regarding use of the Teesta water. This paper reflects the findings of a sample survey carried out in the Dalia Irrigation Project area in 2000 and another follow-up survey in 2007 to show the changes in socio-economic and environmental situation. Moreover, recommendations made in earlier studies have been highlighted and reasons why these recommendations were not implemented have been pointed out.

Introduction

The multifaceted uses of water are well known. But just as its abundance and efficient management enhances quality of life, its scarcity and wasteful use brings misery to many. Scarcity of water has a negative impact on health, availability of food, and the people's lives. The poor are particularly vulnerable when water is of poor quality or in short supply. The Asia Pacific region is home to almost a billion of the world's poorest people; access to adequate and clean water is one of their principal concerns. For many, supply of irrigation water for their crops is a matter of life and death. In fact, difficulties of having access to water frequently determine the position of the poor on the poverty scale (ADB 2005). Water availability is a key ingredient of development and is influenced by a variety of factors. As a valuable natural resource, the issues connected with managing it are inherently diverse and complex. Policies for sustainable use of water need to be developed in consultation with all stakeholders. Especially, in using transboundary water or international rivers, the right of all riparian states should be considered carefully. In this regard, regional cooperation is one of the most basic factors affecting optimal use of international water bodies.

Bangladesh is surrounded by India on all sides. There are hundreds of rivers in the country, 54 of which have their origin in India (Islam & Higano 2002). Naturally, being situated downstream, Bangladesh is dependent on India for an equitable share of the international river-water supply.

Water problems in Bangladesh arise mainly during the dry season and the rainy season. Flash floods occur in summer and inundation occurs in the rainy season with sudden release of water at the upstream end or because of heavy downpour. Again, in the dry season, the small rivers dry up because of shortage of water in the big rivers due to upstream withdrawal of water through barrages built and operated by India.

As a result, various irrigation projects in Bangladesh have ceased to function, causing loss in crop production and increase in poverty. An example of the controversial use of common river water by India and Bangladesh is the Teesta River. The Teesta Barrage Irrigation Project was undertaken and partly implemented in Bangladesh while another barrage (Gazoldoba Barrage) was built 60 kilometers upstream on the same river by India. In this paper, changes in socio-economic and environmental situations in the Dalia irrigation project area during 2000-2007 have been highlighted. A socio-economic survey was carried out in 2000. In 2007, another follow-up survey was carried out in the same area using the same questionnaire. The findings of the surveys show both positive and negative changes. Recommendations made in earlier studies have been highlighted and reasons why they were not properly used to change the lives of the farmers in the study area have been discussed.

Two Mega Irrigation Projects on the Teesta: Dalia (Bangladesh) and Gazoldoba (India)

The Teesta Barrage (Dalia) is the largest irrigation project of Bangladesh. It stands across the Teesta River at Dalia-Doani point in Lalmonirhat district. The Barrage is located 16 km. downstream from the Bangladesh border at Dalia-Doani point, is 615m long and has 37 gates each 12 meters wide. The Teesta project covers seven districts of northern-Bangladesh. Although the project was initiated in 1960, its actual implementation began in 1979. Construction of the canal system started in 1984-85 (Teesta Barrage Project, BWDB 1993). The barrage was completed successfully in August 1990 and its operation commenced in 1993. The total cost of the whole project was US$ 220 million (Teesta Barrage Project, BWDB 1993). There is a 4,500 km long network of canals for supplying irrigation water to the fields using a gravity irrigation method. Thus, no pumping cost is involved. In the first year of operation of the Dalia Barrage (1993), an area of about 65,000 bighas (16,000 acres) was brought under High Yielding Variety (HYV) paddy cultivation in the dry season. The project also had the aim of flood control and drainage for a target area of 750,000 hectares, of which 540,000 hectares were irrigable.

While Bangladesh's Teesta Barrage Project was designed to utilize the water within this river basin, India's "Tista Multipurpose Project" aimed at transferring water from the Teesta to the Mahananda river, which forms part of a different basin, i.e., the Ganges basin (Abbas 1984). This action was deemed likely to have adverse effects. At the initial stage of implementation of India's project, the barrage was built at Gazoldoba in Jalpaiguri district, situated about 66 km. upstream of the Dalia Barrage site.

The total target area under the Gazoldoba barrage is 228,000 acres. This barrage started to withdraw water excessively in the dry season in 1996, when the Dalia Barrage (Bangladesh) was in operation. According to the Bangladesh Water Development Board (Teesta Barrage Project, BWDB 1993), due to operation of the Gazoldoba barrage, water flow of the Teesta River decreased significantly, threatening the water-availability situation in Bangladesh. Exclusive control of Teesta's waters in the dry season at Gazoldoba makes the Dalia Barrage useless; furthermore, the sudden release of excessive water through the Gazoldoba Barrage during the rainy season causes floods and bank erosion, and causes serious suffering of the people in the Bangladesh area of the basin.

The water level at Dalia point in different years is shown in Figure 1. The minimum flow at this point in the dry season has drastically decreased since Gazoldoba barrage began its operation, while the maximum flow has been maintained in the rainy season. According to the figure, we note that the present situation of the flow of water at Dalia point is very severe and the barrage is useless with the Teesta River remaining dry. This crisis in Bangladesh is causing environmental problems and hurting the economic conditions in the area.

The Objectives of the Surveys

The surveys conducted in 2000 and 2007 had the following objectives:

- To understand the socio-economic situation prevailing in the study area.
- To identify the socio-environmental problems and to study the changes in these problems between 2000 and 2007.
- To focus on the causes of the changes that have occurred.

Methodology

To learn about the socio-economic conditions, to identify the socio-environmental problems, and to determine the changes during the period 2000-2007, the results of a socio-economic survey that had been conducted in the target area in December 2000 were compared to those found in the survey carried out in February 2007. The same questionnaire was used for both surveys. The target population of the study were households with at least .27 acres (1Bigha) of cultivable land. Heads of such households were randomly selected from the total target population of around 7,500 households in 2000 and 8,250 in 2007. Ten percent of the population (760 households in 2000 and 825 in 2007) was included in the sample.

In 2000 and 2007, surveys were conducted in 19 villages of 4 unions of 2 thanas (police station) on the bank of the Teesta River of Nilphamari district in Bangladesh. The average age of the respondents was 45 in 2000. Among the respondents 95% (n=720) were male and 5% (n=40) were female. In 2007, the survey was conducted in the same target area. The average

age of the respondents was 43. Among them 90% (n= 137) were male and 5% (n=10) were female.

Data Source and Techniques of Data Collection

Data sources were both primary and secondary. Primary data were collected through face-to-face interviews, while the secondary data were collected from various agencies, e.g., Water and Sewerage Authority, Bangladesh (WASA); Bangladesh Water Development Board (BWDB); Teesta Barrage Monitoring Office, Dalia, Lalmonirhat, Bangladesh; Ministry of Agriculture Bangladesh; Indian Journal of Meterological Geophysics; Indo-Bangladesh Joint River Commission (JRC) records, Daily discharge and water-level Data supplied by the Dalia and Kawnia water monitoring point authorities; Asian Development Bank (ADB), Bangladesh Bureau of Statistics (BBS) and online resources.

Results and Discussion

Changes in Scio-economic and Environmental Situations During 2000-2007

In 2000, all the respondents were fully or partially dependent on agriculture, with most (63%) being involved in agriculture only. The landless day laborers worked in the agricultural fields of the landholders. Only 17% of respondents had a business. The average yearly income of the respondents in 2000 was US$ 794 (1US$ = Tk 56) and in 2007 it increased to US$ 1,202 (1US$ = Tk 68). However, in 2007, the proportion of those depending solely on agriculture decreased by 10% (53.02% depended solely on agriculture). Thus the increase of average income includes contributions of sources other than agriculture.

A comparative distribution of land ownership in 2000 and in 2007 within the Dalia irrigation area shows that in 2000, 73% respondents held .5-5 acres of land, 14% held 15 acres or above, 8% held 5-10 acres and only 5% held 10 -15 acres. In 2007, 78% of the respondents held .5-5 acres of cultivable land, 16% held 5-10 acres and only 6% held 10-15 acres. None held land up to 15 acres or above in the target area.

On literacy, in the year 2000, 40% of the respondents had completed primary school, 29% were illiterate, 23% went to secondary school and only 8% went to college for higher education. In 2007 only 3% of the respondents were illiterate, 65% completed primary school, 30% went to secondary school and only 2% went to college for higher education. It shows that the number of illiterate people has decreased in the target area and the proportion that had completed primary and secondary education increased significantly. However, the number of those who sought college education decreased noticeably.

Figure 2 shows amounts of different types of land owned (in hectares) in 2000 and 2007 within the Dalia region. We see that little has changed regarding the proportion of different types of land in 2007. The proportion of Doas (very fertile) was the largest. There was very little sandy or unfertile land under the surveyed area. In fact, most of the land was Doas (very fertile) in the Dalia barrage targeted area.

In 2000, 76% of the farmers were using urea and TSP in their land for cultivation. Fifty percent were using cow dung and 34% were using compost. The Agricultural department of the Bangladesh government and various NGOs educated them about the benefits of using compost and cow dung for high yielding and sustainable agricultural production. In 2007, 75% of the respondents used Urea, while 62% used TSP. However, among these respondents use of cow dung (12%) and compost (10%) was very low. The reason for this could be that use of animal power for cultivation decreased in the area. It was more costly to plough the land using oxen than using power tiller. Therefore the production of cow dung had decreased, and hence its use as fertilizer also decreased.

In the Dalia target area 67% land was cultivated three times, 28% land was cultivated twice, and 5% was cultivated only once. There was no difference regarding cropping intensity in the years 2000 and 2007.

On housing conditions between 2000 and 2007, 69% of the houses in 2000 were katcha (made by bamboo, straw and stalk etc.), 30% were made of corrugated iron sheets (roof only), wood and bamboo, and only 1% houses were pucca (concrete building). In 2007, 18.42% houses were katcha, 71.05% were made of corrugated iron sheets (roof only), wood and bamboo, and 10.52% were pucca (concrete buildings).

In 2000, 43% of the respondents in the Dalia area were in ill heath, 43% were in a tolerable condition and only 14% respondents were in good

health. On the other hand, in 2007, 14.06% were in ill health, 25.81% were in a tolerable situation and 60.12% in good health condition. The situation has improved significantly for which the credit mainly goes to the activities of the NGOs (e.g., Grameen Bank, BRAC, ASA etc.) working in the study area.

Most (78%) of the respondents were drinking tube-well water in 2000, 17% were drinking dug-well water and 5% drank from rivers and ponds. In 2007, 82.24% of the respondents were drinking water from tube-wells, 17% used dug-wells water and 0.48% drank from river and ponds. The tube-wells in the target area were not contaminated by arsenic poisoning.

In 2000, 74.47% of the respondents had no latrine: They used bushes, bamboo gardens and open public spaces. But in 2007, the percentage dropped dramatically to 18.54%, mainly due to the health awareness programs undertaken by several NGOs (e.g., Grameen Bank, BRAC, ASA etc.). The sanitation situation has also improved significantly in 2007 as compared to 2000.

Regarding natural disasters, all respondents selected more than one answer about the types of natural disasters they experienced during the last 5 years. In 2000, 96% mentioned flood, 70% mentioned river erosion, 39% cyclone and 26% faced drought and dust. In 2007, 17% mentioned river erosion, 79% mentioned floods as the most significant disasters in the area. Clearly, in 2007, people faced much less natural disaster than in 2000.

In 2000, among 760 respondents, 532 (70.37%) replied that the barrage had not created new jobs. In 2007, 658 (85.58%) respondents replied that the barrage has not created new jobs. Thus we find that according to the respondents, utility of the Dalia barrage project as a means of creating new jobs decreased in 2007 as compared to the year 2000.

Respondents also indicated the types of benefits they had enjoyed since the operation of the barrage in 2000 (see Table 1). In the Dalia area, the production of rice had increased tremendously. The transportation system had improved and bridges and culverts were built and electricity was introduced. The working spirit was elevated, employment in agricultural labour sector increased and rural poverty started to decrease. Unjust distribution of products in sharecropping had decreased and the wages of agricultural labour increased. However, the highly positive observations and expectations that were expressed in 2000 were attenuated in 2007.

Policy Recommendations

Research has been carried out on the sharing of the Teesta waters and various policy recommendations have been offered. For example, in Islam & Higano (2002) the policy recommendations were:

Establishing a Special Economic Block

Both countries can take initiatives for (i) preservation of monsoon-season water, (ii) integrated control of flood water and (iii) bilateral trade and business.

Planning and policymaking emphasis must be placed on optimal and amicable water sharing based on a suitable trade model.

Bangladesh should also make certain arrangements so that Indians, using the Teesta River water (at Dalia or northern districts), can avail opportunities for business and trade in Bangladesh.

Joint ventures (co-project or bilateral agricultural projects) should be encouraged to establish mills and factories (e.g. rice mills, tobacco husking mills, paper mills, food processing mills) dependent on crops produced in the Teesta region.

Reducing Bilateral Conflicts and Ensuring Justice

Both Bangladesh and India are recognized as third world countries. Both countries should try to cooperate mutually for socio-economic development, rather than engaging in conflict and wasting time and resources (Islam & Higano 2002).

Extensive cooperation is required in developing infrastructural connectivity and facilitating transit of goods within the region.

However, it must be remembered that "mutual confidence and cooperation" (Schachter 1977) between the leaders of India and Bangladesh is necessary for an economic policy to be implemented properly. Leaders of both sides have to be sincere in their efforts. They must also have

an open mind and be ready to accept rational and reasonable suggestions offered by their counterparts (Islam & Higano 2002).

Realities

Though the present political situation of Bangladesh is quite different from what was observed in the last two decades (1987-2007), the following issues still need to be addressed

- Every year when the dry season arrives, news of new record-low water levels at the Teesta Barrage site is reported. Bilateral meetings did not lead to any permanent solution because there was no bilateral agenda to ensure bilateral economic benefits.

- Policy planners of the government usually do not seek opinions of researchers before policy planning. In the developed world, policy planners have direct relationship with relevant experts who guide them in policy planning. For example in Japan, when posting a traffic signal, cost-benefit studies are carried out before a decision is made. But this is not so in Bangladesh; rather the policies are imposed by the planners themselves. The results derived from research projects usually do not reach the table of the policy planners.

- Political bargaining gets priorities over economic necessities. Bilateral treaties and policies that are only politically induced cannot bring about socio-economic welfare of a region.

Conclusion

Based on a social survey, an overview of the socio-economic and environmental situation existing in the Teesta Barrage target area has been presented in this paper. A comparative picture of the target area of 2000 and 2007 has been highlighted. It was found that some improvements have occurred among the inhabitants regarding income, education, housing, health and sanitation. However, this has occurred through NGO interventions and by using underground water for irrigation. Deep and shallow tube wells are mostly run by diesel (Islam and Akmam 2007). However, both the use of fossil fuels and the extraction of underground water are detrimental to the environment. Instead, using Teesta water for irrigation would be much more cost-effective and environment-friendly.

In fact, we note that while positive changes have occurred in the Teesta Barrage area despite the influence of the Gazoldoba Barrage, things could have been much better on the Bangladesh side had the Teesta waters been available as envisaged by planners. For example, food production is always a crying need, and to produce more food deep tube wells (DTW) are currently being used, given the shortage of surface water. DTW is expensive on the one hand and detrimental for the environment on the other. Also, through over extraction of underground water, the water table is going down, making the area vulnerable to earthquakes. The option of having surface water (Teesta Barrage water) is the best option, which would enable the farmers to use cheaper irrigation water that would also be environment-friendly. Moreover, it is likely to create better job opportunities, leading to economic emancipation of the poverty stricken people.

Important policy recommendations have been proposed in this paper on the basis of past studies. The realities regarding implementation of such policy proposal are very complex and time consuming since there are regional and international links to the problems of this area. To avert a crisis, regional cooperation and working together to solve the problems are imperative, considering the holistic goals of providing greater benefit of humanity. The states comprising the Teesta Basin area, today, must work together and extend their hands of cooperation to each other to achieve an amicable solution to the Teesta Basin problems of water sharing.

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APPENDICES

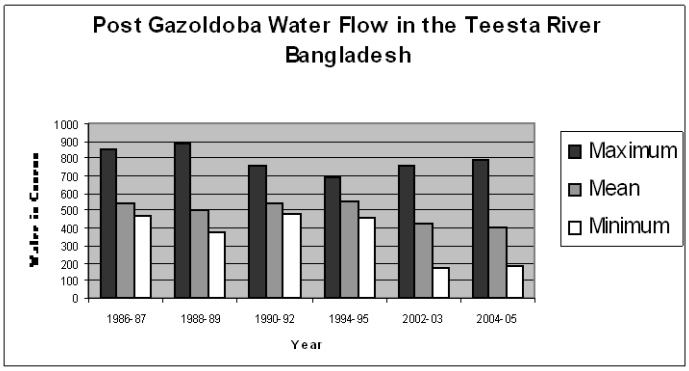

Figure 1. Post Gazoldoba Water Flow in the Teesta River, Bangladesh

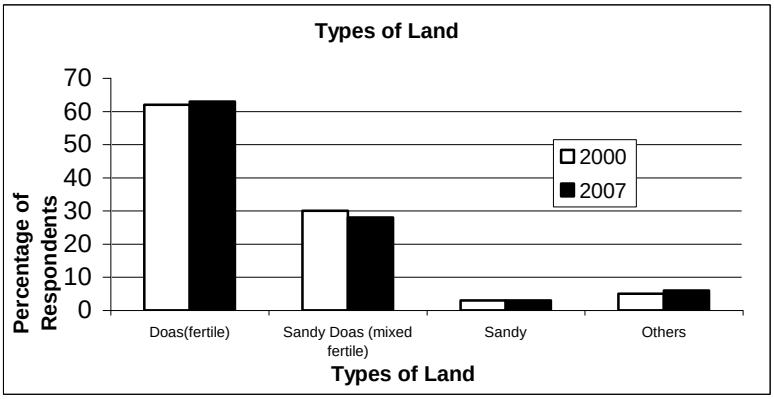

Figure 2. Distribution of Types of Land in the Target Area

Table 1. Types of Benefits (Provided by the Barrage) Enjoyed by the Respondents

Target Area	**Types of Benefits**	**2000**	**2007**
		Percentage of the respondents	**Percentage of the respondents**
Dalia	Production of crops increased	100%	100%
	Transportation system improved, bridge, culvert, electricity have been introduced	100%	75%
	Working spirit aroused, employment in agricultural labour sector increased and rural poverty started to decrease	100%	55%
	Mal-distribution of product in share cropping has been decreased, wage of agricultural labour increased	65%	45%

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Public Private Partnership for Efficient Port Operation: A Proposal for Chittagong Port Authority

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and
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Abstract

Chittagong Port is the principal gateway of international trade and commerce in Bangladesh. The maritime dependency factor of Bangladesh is 30%, of which 89% of the trade in volume terms is handled by Chittagong Port alone. Also the port contributes 35-40% of the government budgetary revenue through the earnings of export-import taxes, excise duties, VAT etc. About 7,000 employees are employed by Chittagong Port Authority (CPA), which is addressing the problem of unemployment to some extent. But the CPA is unable to provide prompt and efficient port operation as compared to private sector port operation of other countries due to hierarchical, bureaucratic and time-consuming decision making processes. In the recent past, port operation through Public Private Partnership (PPP) has grown. Computerized Container Terminal Management System (CTMS) and Management Information System (MIS) must be introduced to avoid crime, corruption, and costs associated with documentation processes.

Introduction

Ports play a vital role in trade and economic development. They must have adequate facilities such as multimodal transportation systems, adequate infrastructure, superstructure and modern equipment which are essential for efficient port operations. As an economic tool, a port is a gateway which impacts security, external trade and general economic development. As a logistics platform, the port is a community of professions that serves cargo and ships. The transfer of goods from sea and vice-versa is a good opportunity to add value to the cargo, distribution centre, brokerage, repackaging, and creation of new activities linked to shipping and foreign trade. Unfortunately, the port and transport sector of Bangladesh have not developed as desired to cope with trade and economic development needs. Today, Bangladesh needs a modern, efficient port, which can make important economic contributions to the country (Hossain 2004). Chittagong Port is the principal port of Bangladesh. The maritime sector handles about 89% of trade in volume terms. The maritime dependency of the country on average (2000 to 2004) is 30.8%. Since the Bangladesh economy is not a mature economy, being mostly based on agriculture, the degree of induced impact may be more than 50% (Halima, 2006).

Present Status of Chittagong Port

During 2005-06 Chittagong Port handled 30 million metric tons of cargo including 8,27,174 twenty feet equivalent units (TEUs) of containers, with growth expected to continue. Despite many constraints, the Chittagong Port Authority (CPA) is handling about 92% of the total maritime trade of the country. The rate of GDP growth of the Bangladesh economy is around 6-7%. But the container growth rate at CPA is about 14%, which is double the rate of GDP. Thus the contribution of CPA to the national economy is substantial (Chittagong Port: an Overview, 2006).

According to Oram and Baker (1971), "No single cause directly affects the cost of living of a maritime country than the speed with which ships turn-around in her ports." But the main efficiency indicator, average turn-around time of ships, is 5.09 in Chittagong Port which is 5 times higher than the Singapore Port and Colombo Port, and 2.5 times higher than Bangkok Port and Jawaharlal Port (Maksuda Lillah 2007). "Ship turn-around time is an excellent indicator of the speed of services being provided to ship operators; it is a very important element in maritime transport costs" (Roach 1982). Waiting time and service time constitute the turn-around time: "A 15% reduction in service time results in a 45% reduction in waiting time and 28% of turn-around time" (Francou 2002).

The CPA is a public enterprise under the Ministry of Shipping, Government of the People's Republic of Bangladesh, and is tied up with a multitude of laws and decrees issued by

various Ministries. This hinders prompt and efficient port operation, as compared to the private sector port operation of other countries, due to hierarchic, bureaucratic and time-consuming decision-making processes. The port activities should have a dominant private sector character, with financial and operational independence from the government, so that it can operate under the framework of a market-oriented economy. In the recent past, port operation through Public Private Partnership (PPP) has improved. Different countries are reviewing their seaport policy, opting to use the Land Lord model for seaport management with a private- public participation formula in investments. In the Land Lord concept, the port authority owns the basic infrastructure only (for example, land, access and protection assets) and leases it out to operators, chiefly on a long-term concession basis, retaining all regulatory functions.

The merits of such a model are small investment required from the government, efficiency and low price (determined through competition); however, the demerits are exclusive use and discriminatory treatment. The best examples of this type of arrangement is seen in the European major ports (namely Rotterdam, Hamburg and Antwerp), US major ports (Los Angeles, Long Beach, New York and New Jersey), Kelang (Malaysia) and Laem Changbang (Thailand). Now-a-days ports are becoming more competitive and are trying to improve efficiency, reduce cargo-handling cost and integrate port services with other components of the global distribution network. To achieve this, new ports are coming into being in the private sector and the existing public ports are reforming themselves by restructuring their existing facilities and by involving more of the private sector. There are many convincing reasons for such restructuring. To reform the existing port facilities in the public sector by involving private sector participation, 'private-public participation' has become popular. Privatization of port facilities in a planned and systematic way for efficient operation cannot be overlooked by Bangladesh since increased globalization needs efficient port services and facilities. Most probably Bangladesh is also going to adopt the Land Lord model concept because IIFC has suggested building the New Mooring Container Terminal infrastructure of Chittagong Port on SOT (Supply, Operate and Transfer) basis (minutes of PSIC, 2007). A new dimension of port operation is seemingly opening up in Bangladesh.

Performance of Chittagong Port

The productivity of any system is viewed as its output in relation to inputs and is a measure of efficiency in the utilization of resources. Efficiency is one of the three basic output dimensions of organizational performance; i.e., performance depends on efficiency, effectiveness and participants' satisfaction (Meletiou 1998). The growth rate of container and cargo handling at the port is increasing in spite of the political unrest in the country**.** A report indicated that the rate at which containers are being received from ships is much higher than the delivery from the port, resulting in growing congestion (Minutes of PSIC 2007).

Also, the sudden increase in the number of feeder vessels from 28 to 53 (99%) in 2006 has created vessel congestion in CPA, which is inconsistent with the container growth (12%). The existing equipment of CPA cannot cope with the ever-increasing number of containers (See Table 1) coming into the port, resulting in overstressed equipment that frequently break down.

It may also be noted that all the development expenditures are met from its revenue surplus and CPA contributes to Value Added Tax (VAT) which is shown in Table 2.

The average turn-around time at CPA is 6.47 days which is very high and equipment availability is very low by any standard. That is, about half of the time equipment is not available when required which has consequences for gang productivity as well as throughput. The average container dwell time in the Port is 15-20 days, whereas in neighboring countries it is less than 6-7 days. The dwell time could be reduced substantially if the importers take delivery of their containers within the 4 days free time.

A study by Belayet (2001) identifies five important factors that are responsible for the poor performance of the port. They are (i) Lack of developed inland transport system and logistics (ii) Complex custom and port clearance procedure (iii) Ministry's control and interference (iv) Bureaucratic decision-making process at the port (v) Role of Dockworkers Management Board (DWMB). Frederick (2001) also indicated that the Chittagong Port continues to employ a large labor force, which is both cost

Table-1 Cargo, Container and Vessel handled during last ten years

Year	Cargo (Ton)	General Vessel (number)	Container (TEU)*
2000	1,60,23,109	1462	4,56,007
2001	1,76,18,540	1631	4,86,289
2002	1,91,60,189	1602	5,26,353
2003	2,14,41,889	1720	6,24,560
2004	2,18,72,432	1764	6,88,771
2005	2,58,84,891	1892	7,83,353
2006	2,70,64,632	1957	8,76,186
2007(jan-jun)	1,33,86,502	961	4,61,404

Source: Chittagong Port: An Overview
*TEUs = Twenty Feet Equivalent Units

Table -2 Value Added Tax and Annual Expenditure of CPA

Year	VAT (Crore TK)	ADP Expenditure (in Crore Taka)	Foreign Currency Earned (in crore taka)	Total revenue earning by CPA (in crore taka)	% of Total earning
1999-00	24.00	1.66			
2000-01	48.00	60.18	219.42	477.00	46%
2001-02	55.00	19.27	260.37	531.37	49%
2002-03	53.00	30.72	260.00	530.66	49%
2003-04	55.00	62.44	256.38	557.36	46%
2004-05	72.00	147.70	311.89	649.78	48%
2005-06	105.00				

Source: Halima (2006)

Table 3- Operational Indicators

Indicators	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2007(Jan-Jun)
Turn around time of Vessels (days)	4.69	7.11	6.49	5.90	6.15	4.56	4.30	3.99	4.05	7.10	6.29
Equipment availability (%)	50.04	49.97	52.72	48.87	45.24	59.26	66.08	68.98	66.76	49.94	
Berth occupancy (%)	83.68	86.79	86.76	86.95	87.30	63.51	67.93	71.76	68.23	69.38	
W ratio%			74	55	62	44	43	32			

Source: Halima (2002)
CPA: an Overview, Different Years

effective and redundant. In 2004, the number of registered dock workers was 6,000 and belonged to the various registered trade unions under the DWMB. To improve the performance of the labor force, the Chittagong Port Authority recently abolished the DWMB.

PPP in Port Operation

The literature on public and private partnership (PPP) has increased substantially (Mangematin 2004). PPPs have proved particularly appealing to policymakers (Chataway and Smith 2006). In the literature of institutional economics, public-private partnerships are viewed as a government strategy designed to minimize transaction costs: the costs associated with forming, coordination, enforcing and sustaining contractual relationships between actors engaged in the production of goods or services (Williamson 1975). In particular, private sector participation can contribute to achieving the following objectives of the port operation as mentioned in an ADB (2000) report.

- provide services which are efficient and cost effective from the port users' perspective.
- respond to changes in cargo-handling technologies
- respond to the changing requirements of the port users.
- provide choice of services and foster competition
- make timely capital investment to improve efficiency and expand capacity.
- generate funds needed to finance investments.
- enforce labor discipline in the face of strong trade unions.

In general, ports and terminals today are trying to:

- Improve port efficiency
- Lower cargo handling cost and
- Integrate port services with other components of the global distribution network.

The privatization of port facilities has led to good results. The term 'privatization' is used in a strict sense: that is "the transfer of ownership of assets from the public to private sector". The private sector is noted for better investment capabilities, efficient management, and, most of all, its close connections with the port service-receivers, namely the shipping lines. As a public agency, inefficiency of CPA remains a key-barriers to imports into and exports from the country. It is important that co-existence of public-private cooperation based on different formulas of ownership and management of assets be adopted, reflecting the PPP paradigm.

One should also distinguish between port assets and their operation. Normally, if the port authority owns the assets which are used by the private sector, keeping the regulatory control with the ports authority, the situation will be conductive to cost-effective use of the assets to provide efficient port services. Many public sector ports are still continuing to float tenders for private partnership in various ports and terminals. This has resulted in an increase in the trend of public-private participation (PPP) in port operations. According to Lorimer (2000), nearly all general cargo handling capacity has been privatized, (i.e., the ship-shore cycle is in the hands of private companies). The most common structure of ports in developing countries like India, Argentina, Chile, Brazil, Egypt and Sri Lanka is as follows (Rose 2000):

- State involvement
  -Regulatory role
  -Land Lord role (infrastructure, channels, safety and control of competition and port policy
- Private Participation
  -through concession/BOT.

Recently, the President of Chittagong Chamber of Commerce and Industries (CCC&I) emphasized the PPP model for port operation saying, that it would be the most suitable model for developing countries where the interest of all concerned could be protected (Minutes, 22/1/07).

Scope of Private Sector Participation in Chittagong Port:

As a step towards securing private participation, clear and transparent policy guidelines must be adopted for the ports in Bangladesh by establishing new physical port/ terminal structures on Build, Operate and Own (BOO), Build, Operate and Turnover (BOT), or Supply, Operate and Transfer (SOT) model as is widely practiced in most Asian countries. The following areas have been initially identified for private participation:

- Leasing out existing assets of the port.
- Financing, construction, creation and operation of additional or new assets, such as container terminals, berths, warehouses, container freight station, inland container

depot, storage facilities, tank farms, cranage, handling equipment, captive power plants, dry-docking and ship repair facilities.

- Leasing in equipment for port handling and floating crafts from private sector, evaluation of which would be on the basis of least cost to the port. The ports will have to ensure leasing of modern equipment under revised conditions.
- Based on least cost to the port for pilotage, the need must be assessed by the CPA on the basis of existing floating crafts/pilots.
- Captive facilities for the port, based on lowest tariff, must be quoted for sale of electricity to the port, provided such industries are port-specific and are approved by the concerned ministries.
- River and other port authority dredging requirements through concession.

Modes of Privatization:

Generally speaking, involvement of the private sector with ports is vital to improving the efficiency under different strategies of private sector participation. Private participation in port and commercial operations can be encouraged by many alternative modes including:

- *Leases* – This is *"an agreement conveying the right to use an asset (land or equipment, or both) for an agreed period of time in return for a payment or a series of payments by the leaser to the leasor."* The duration of the lease is between 10 and 15 years. Usually, in this mode, the lesser does not become responsible for investments and in case of construction of any permanent facility, equipment or installations by the leasor, it is to be agreed upon under the lease or concession.

- *Management Contract* – Under such contract, the port authority retains ownership of the assets and remains responsible for provision of further capital, while the private sector is obliged to provide management expertise.

- *BOT Arrangements* – These contracts are legally referred to as "Concessions." This is due to the fact that they lead to "*grant of special privileges by government."* It is a technique of creating, delivering and operating a *public utility*. The BOTs are the most popular tools by which private investment is procured for public services in various ports.

- *Joint Venture* – If the CPA is allowed by its statutes of establishment to invest in a port related business, it may in association with the private sector form a mixed company which will conduct port operations. This was particularly successful in China (e.g., Shanghai Container Terminals).

- *Stock Market Flotation of Shares* – This means selling of the public port to the private sector through the stock market. However, the government can retain a majority of the shares.

- *Outright Sale* – this means that the public sector assets will be directly sold to a major private investor or a group of private investors (e.g., consortia); usually this is done through a competitive tender and can be a "negotiated sale."

Recent Improvement of Chittagong Port Operation

According to Mohamad (2002), "No matter how information technology advances, world trade cannot be facilitated without ports. This is exactly why every country needs to develop more advanced and efficient ports for its prosperity". Chittagong Port has undertaken many ambitious projects to enhance its capacity, improve performance and quality of service, and build adequate facilities to make it a world class port. All documentation at different points regarding container clearance has now been brought to one point with banking facilities where the documentation procedure is being completed within 30 minutes by using a one-stop service center.

The port is now connected with the hinterland by road, rail and river. It is now drafting a multimodal transport policy. All vessels at anchor and berth are interfaced with port operation by shore based AIS traffic control. Security situation of port facilities and ships are monitored as per ISPS code (effective from July 1, 2004). Chittagong Port Trade Facilitation project is working to increase the port's capacity for cargo and container handling in accordance with international best management practices and standards in the port of Chittagong. This project is working to increase CPA terminal capacity by 50% from the present level, reduce vehicle waiting time to enter and exit the port by 30%,

improve custom inspection time by 30% and customs clearing time for import container by 30%, reduce average container dwell time at least by 20%, ensure vessels turn-around time and berth occupancy rate by 20%, enhance port charges by 20% and remove full container load (FCL) container stripping from the port. The CPA trade facilitation project is also working to install a computerized Container Terminal Management System (CTMS) and MIS to change from the reactive system to a pro-active system, and to reduce collusive and coercive corruption. This project is also constructing port service roads and oil waste receptor plants, and reconstructing/upgrading internal roads (CPTFP, improvement report, 2007). Nearly 83% of the physical work of construction of the New Mooring Container Terminal (NMCT) has already been completed; the rest is expected to be completed by December, 2007. Two berths were already put into operation in September 2006. It was also decided to operate NCT on SOT basis (Minutes, 22/1/07).

Regulatory Framework:

The port is an interfacing point between land and waterways. To provide better service, concerted and coordinated efforts of all the players of the transport sector such as BR, RHD, BIWTC, BIWTA, NBR (customs), MOC, MOS, port users, and trade bodies are of paramount importance. The port authority will discharge their regulatory role under Chittagong Port Authority Ordinance 1976. In particular, the upper ceiling of tariff which the private sector can charge for its facilities would be fixed by an independent regulatory authority set up by the GOB. Both the private investor terminals and the port authority operated terminals would be free to charge less than the notified tariff.

The proposed independent regulatory authority shall also ensure that private investment does not result in the creation of private monopolies and that the private facilities are available to all users on equal, non-discriminatory, and competitive terms. Necessary steps must also be taken so that private investors will be obliged to protect national interests like national security and national emergencies. The private sector will also abide by various statutory requirements for the protection of the environment, anti-pollution measures, safety, navigation, and conservation, and also abide by the directives issued by GOB/ Port authority.

Conclusion and Recommendations

Privatization of port facilities in a planned and systematic way is imperative for Bangladesh since, with increasing globalization, efficient port services and facilities with optimum productivity will be needed to extend port services of international standard to its clientele. The existing legislative framework permits private sector participation in ports but needs to be specified more clearly. The specific suggestions for efficient port operation may be as follows:

1. Ports may continue to discharge their regulatory role under Port Ordinance, 1976.

Ports can also take steps to frame regulations consistent with the guidelines in order to enable private sector participation.

2. BOT/SOT model is preferable for private sector participation. Generally a concession period of 20-30 years may be permitted. There must be transparency in inviting bids following two-envelop system. Evaluation will be based on maximum revenue realization to the port using NPV analysis. Ports can form a taskforce comprising port-related agencies for finalization of proposed guidelines.

3. The private investor will be obliged to protect national interests like national security and national emergencies. The private sector will also abide by the various statutory requirements for the protection of the environment, anti-pollution measure, safety, navigation, conservancy, etc. and also abide by the directives issued by the GOB/ Port Authority.

4. The average container dwell time in the port is 15-20 days (Advisory meeting presentation, 2007), whereas in neighbouring countries it is less than 6-7 days. The dwell time could be reduced substantially if the importers take delivery of their containers within the four days free time. In this case an independent regulatory authority set up by GOB can be assigned to i) fix tariff rate which is minimum 10 times greater than the present rate after the allowable duration of four days (tariffs have to be revised suitably every three years on the basis of inflation) so that the port is not used as a store or show room, ii) ensure that private investment does not result in the creation of private monopolies and the

private facilities are available to all users on equal, non-discriminatory and competitive terms.

5. In the case of Chittagong Port there is no network of information developed between the port authority and its users. Every organization has stand-alone computer systems. Even intra- networking system has not been developed within the organization. As per UNCTAD, computerization is a must when handling exceeds 50,000 TEUS. So, introduction of automation and on-line computerized container terminal management system (CTMS) will definitely reduce the port cost and crime to a great extent.

6. In the absence of multi-modal transport systems, the economy is yet to reap the benefits of containerization. In point, after the advent of containers, more than 25 years have passed. Moreover, the port is not connected with the capital, Dhaka, by a good highway. Though Bangladesh is a riverine country, no facility for the transportation of the containers from the port to the hinterland has been developed. A multimodal transport system is needed to minimize congestion in the port and the transportation costs.

7. Access to the information highway that is Computerized Container Terminal Management System (CTMS) and Management Information System (MIS) must be introduced to avoid crime and lower costs with the documentation process.

8. In the absence of a trade facilitation system, many steps (Custom-22 steps, CPA-19 steps) are followed to clear an imported consignment. Besides, the attitudes of importers to use the port as storage place also aggravates the situation. The present system in place to compel the importer to take back empty containers is not sustainable.

9. About 58 stevedoring companies and 2200 C&F agents are licensed and enlisted to CPA. But there is no organization to protect labor rights.

It is vital at this point to consider private sector participation for improving the infrastructure facilities for efficient port operation by creating a master plan of the port.

GLOSSARY

BIWTC-Bangladesh Inland Water Transport Corporation
BIWTA-Bangladesh Inland Water Transport Authority
BOT-Build, Operate and Transfer
BR- Bangladesh Railway
CPTFP-Chittagong Port Trade Facilitation Project
CTMS-Container Terminal Management System
DWMB-Dock Workers Management Board
FCL-Full Container Load
IIFC–Infrastructure Investment Facilitation Center
ISPS-International Ship and Port Security
MIS-Management Information System
MOC-Ministry of Communication
MOS-Ministry of Shipping
NBR-National Board of Revenue
NCT-New Mooring Container Terminal
PSIC-Port Service Improvement Committee.
RHD-Roads and Highway
SOT-Supply, Operate and Transfer

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