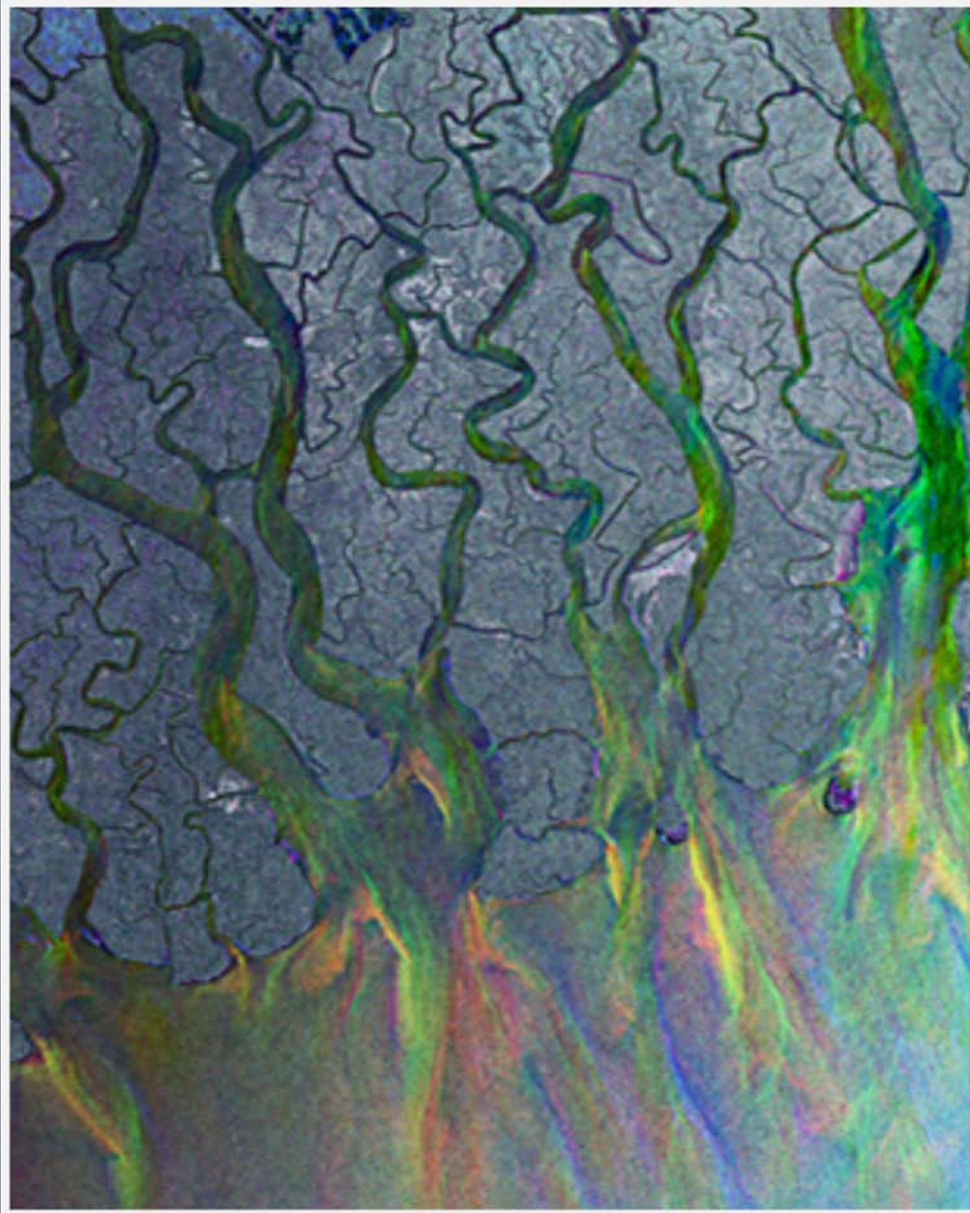


Technical Recommendations to Bangladesh Government

From 2009 AABEA 25th Anniversary Seminar Series

SILVER JUBILEE

AMERICAN ASSOCIATION OF BANGLADESHI ENGINEERS & ARCHITECTS



University of Maryland, Shady Grove Campus, Rockville,
Maryland October 10, 2009

25 Years of Working Together



February 8, 2010

The Honorable Prime Minister Sheikh Hasina
Government of Bangladesh
Prime Minister's Office
Old Sangsad Bhaban
Tejgaon, Dhaka-1215
Bangladesh

Your Excellency,

As you know, the American Association of Bangladeshi Engineers and Architects (AABEA), is a non-profit, non-political, and non-religious organization, formed exclusively to foster technical cooperation among Engineers, Architects and Computer Scientists of Bangladesh and North America.

On October 10th, 2009, AABEA celebrated its Silver Jubilee 25th Anniversary in the suburbs of Washington, DC. The hallmark of this daylong event was a series of technical seminars on contemporary issues related to our beloved motherland Bangladesh. The seminars were presented and participated by nearly one hundred (100) expatriate Bangladeshi experts in the topic areas.

One major objective of these technical seminars was to generate ideas from the expatriate Bangladeshi experts, develop recommendations and share with the Government of Bangladesh. Accordingly, these summary recommendations include data from technical seminars and comments from other expatriate professionals, which were refined to develop a set of recommendations in four (4) major critical areas that will help to build a self-sustaining and prosperous Bangladesh.

We would like to present you our recommendations in the attached document. We hope that our humble effort will provide you a reflection of the viewpoints and aspirations of Bangladeshi expatriate community in the USA.

If you have any questions, please feel free to contact me at +1-202-841-6269. Thank you,

Sincerely,

Thank you,

Hares Sayed, President
Central Executive Committee (CEC)
American Association of Bangladeshi Engineers and Architects

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TECHNICAL RECOMMENDATIONS TO BANGLADESH GOVERNMENT FROM 2009 AABEA 25TH ANNIVERSARY SEMINAR SERIES

A Working Paper Prepared By the American Association of Bangladesh Engineers and Architects for the Government of Bangladesh

EXECUTIVE SUMMARY

American Association of Bangladeshi Engineers and Architects (AABEA) celebrated its 25th Anniversary in the suburbs of Washington, DC. The hallmark of this daylong event was a series of technical seminars on contemporary issues related to our beloved motherland Bangladesh. The seminars were presented and participated by nearly one hundred (100) expatriate Bangladeshi experts in the topic areas.

One major objective of these technical seminars was to generate ideas from the expatriate Bangladeshi experts, develop recommendations and share with the Government of Bangladesh. Accordingly, summary recommendations were created from the technical seminars and further refined and value-added by other expatriate professionals.

This report focusses on four important topic areas and AABEA believes that all these areas have direct impact on future economical growth as well as well-being of Bangladesh. Most of the Non-Resident Bangladeshis (NRBs) living in the North America believe that an uninterrupted and structured approach towards the planning and implementation of these sectors by the Government can put the country on right track geared towards self sufficiency and economic development. These critical topic areas are:

1. Power Sector Development in Bangladesh
2. Communication and IT Sector Development in Bangladesh
3. Business Issues - Economic Development and Foreign Loans
4. Tipaimukh Dam and Its Impact on Bangladesh

The abstract of this report describes briefly on targeted goals and recommended approaches on financial self-sufficiency, power sector development, water resources sector and information technology and followed by brief full reports on each sector.

Power Sector Development in Bangladesh

Over the last few years one of the most acute problems city dwellers and manufacturers of Bangladesh are facing is the severe power shortage. The erratic power supply leads to disruption to smooth production in manufacturing, agricultural, fish processing sectors as well as severe disruption of water supply. Shortage of power supply not only impedes the economy of the nation but raises an alarm on health sector as well.

The country is generating only about 4200 MW electricity where the estimated demand is over 5500 MW and increasing. The electricity infrastructure of Bangladesh is very old, not well-maintained and running under budget shortfall. In addition, yearly demand is growing, and for sustainable economic growth, it is essential to add 10% additional power in the national grid annually; otherwise it will not create foreign investment friendly atmosphere. When labor cost is rising in China, Vietnam, Malaysia and Indonesia, the foreign investors are looking ways to move their business elsewhere and Bangladesh can be a perfect destination for them. Therefore, this is a golden opportunity for Bangladesh to strengthen its economic backbone.

There was no significant effort on power generation sector for the last several years. The present government has taken an initiative to make Bangladesh power outage free by 2011. To meet this goal, it will need to add at least 2000 MW in the national grid as a short term goal. In the long term plan, it will add additional 1000 MW every year till 2014. The government also has to address the transmission and distribution problems.

This report presents an elaborate proposal on national power policy, master plan encompassing both short and long term policies, control of system loss and improved distribution system, renewable power system as well as demand side management. This report also addresses the funding source for power projects, as opposed to conventional loans presently being employed by the government. AABEA believes when the nation is able to fund these projects, it will not only create competition, but will reduce the implementation cost by 20 to 30%.

Communication and IT Sector Development in Bangladesh

AABEA believes it is imperative to emphasize on communication technology and develop and nurture this sector for the economic development of the nation. As recommended by SBIT 2000 conference, it is necessary to develop the capacity building in this sector and gain market share both in North America, Europe and other 3rd world countries in the world. Knowledge sharing and product development, especially focusing on areas where there is no stiff competition exists and growth prospects are enormous. Selection of such sectors and their ultimate development may put Bangladesh at the top edge in future competition.

Recommendations are made on wireless communication technology, computer and IT sector; and high-bit-rate data transmission infrastructure with emphasis on educational initiatives and development to gain global market share. The recommendations are not only limited to outsourcing opportunities, it also focuses on export of experienced manpower throughout the world.

Business Issues - Economic Development and Foreign Loans

It has long been observed that the 3rd world countries are suffering from lack of funding for its infrastructure development to enhance the quality of life and reduction of poverty. Dependency on foreign and international loans and grants, which are delivered with so many conditions that it provides no meaningful support on economic development, rather put the country under enormous economic burden and debt. In addition, these lenders and their patrons' interference virtually block all development initiatives of 3rd world countries towards self sufficiency. And for Bangladesh is not a different case.

Budget deficit cannot lead the country towards economic development. The nation needs economic independence. Development budgets should be based on known sources of funding rather than expected sources, but it is very unlikely to happen. However, once *expected funding* portion is taken out from the development budget, donor agencies are likely to come forward with necessary funding without any or less conditions attached.

Our geographical independence is long been achieved. However, the country failed to achieve the economic independence. With time, the country has changed significantly and thanks to the independence of the country, millions of Bangladeshi now live in various countries of the world. These NRBs are contributing heavily on nation's economy by sending about \$10 billion a year. This fund can be increased significantly by specific initiatives by the government that will reduce/eliminate dependency on foreign assistance for the development projects of Bangladesh. Recommendations are made to create NRB-GOB partnership by re-enacting 15% interest on remittance on development projects with specific maturity allowing withdrawal of yearly interest in foreign currencies. This will allow NRBs to secure loans from foreign countries on individual collateral securities and funnel that fund for the development projects of Bangladesh.

Tipaimukh Dam and Its Impact on Bangladesh

The government of India is undertaking Tipaimukh Dam project on the international Barak River in the state of Manipur, India, which is located on the northern side of Bangladesh. The Barrack River feeds Surma and Kushiya rivers that flow into the Meghna River, one of the three major rivers in Bangladesh. Therefore, the impact of such mega project demands a thorough review.

This project will generate 1,500 MW of hydroelectric power in addition to controlling floods of the Barak River. However, there is no vital needs for 1,500 MW of electricity for those part of India, nor it will be economically viable to transmit the power to other parts of India. Moreover, any type of obstruction on natural flow of water will always have negative impacts on downstream population.

Since it's an issue of utmost national interest, AABEA experts reviewed the concerns closely including the influence of impacted flows on hydrologic, economical, cultural, social, and ecological balance of the nation. The panel further concentrated its review on the impact of rivers and flows originated at Tippiara Hills and ultimately discharging into Surma Basin. The panel also considered the severe shortage of food grains worldwide and its impact on Bangladesh since it has a shortage of arable farm land, which is increasing every year. Based on presentations, discussions and numerous feedbacks both from NRB and International experts, all findings are compiled and recommendations are made solely for the national interest of Bangladesh. It is the responsibility of Bangladesh Government to make decision considering facts, but not the political interest. It is important that the project creates a win-win situation for both the countries.

The conclusions and findings are presented into three major phases of the project namely, the construction period, the commissioning of power plant, and the operational phase of the project. Recommendations are made based on historical intra-governmental relationship between Bangladesh and India and concluded that a full treaty between the governments under the auspices of World Bank or United Nations, release of all relevant survey and modeling data, including full solicitation package with all contract clauses, engineering drawings and supporting documents before the solicitation is issued for bids, prohibition of any type of barrage to divert water. After full review of documents and negotiations, Bangladesh government should sign-off the document before India government can issue the solicitation. It is also recommended, a long term commitment by India should be gained for uninterrupted supply of power to Bangladesh at a pre-determined cost.

TECHNICAL RECOMMENDATIONS TO BANGLADESH GOVERNMENT FROM 2009 AABEA 25TH ANNIVERSARY SEMINAR SERIES

A Working Paper Prepared By the American Association of Bangladesh Engineers and Architects for the Government of Bangladesh

TOPIC AREA 1: POWER SECTOR DEVELOPMENT IN BANGLADESH

Background

Over the last few years one of the most acute problems city dwellers and manufacturers of Bangladesh are facing is the severe power shortage. The erratic power supply leads to disruption to smooth production in manufacturing, agricultural, fish processing sectors as well as severe disruption of water supply. Shortage of power supply not only impedes the economy of the nation but raises an alarm on health sector as well. Power shortage is forcing traders to preserve perishables with dangerous preservatives such as, formaldehydes, which might cost extra billions of dollar in health sector and might cost millions of lives. The situation is aggravating and practically no planned action has been taken by the government to abate the situation.

The country is generating only about 4200 MW electricity where the estimated demand is over 5500 MW and increasing. The electricity infrastructure of Bangladesh is very old, not well maintained and running under budget shortfall. In addition, the yearly demand is growing and for sustainable economic growth it is essential to add 10% additional power in the national grid annually; otherwise it will not create foreign investment friendly atmosphere. When labor cost is rising in China, Vietnam, Malaysia and Indonesia, the foreign investors are looking ways to move their business elsewhere and Bangladesh can be a perfect destination for them. Therefore, this is the golden opportunity for Bangladesh to strengthen it's economic backbone.

There has not been any significant effort on boosting power generation in the past to keep up with the growing demand. The country is going to face another irrigation season soon and power shortage can influence the political instability thereby the economic backbone of the country.

Present government has taken an initiative to make Bangladesh power outage free by 2011. To meet the demand by 2011 it will need to add at least 2000 MW in the national grid as a short term goal. In the long term plan it will add additional 1000 MW every year till 2014. Government also has to address the transmission and distribution problems.

Since power sector is one of the most sensitive issues facing the country, AABEA arranged technical seminars comprised of experts both from power sectors, energy sectors (fuel), and professionals from other backgrounds. Panelists discussed the following issues:

- Demand, Generation & Conservation
- Suitable types of Power Plants: Fuel Sources
- Funding for Power Plants

This recommendation also contains long and short term goals to meet the energy demand of Bangladesh.

Recommendations

The conclusions and findings are as follows:

Policy Summary

To meet the demand and take the country out of economical demise, AABEA recommends the following policy initiatives:

- Ensure stable, secure, diverse and sustainable supplies of energy at least economic cost.
- Reduce dependence on imported fuels through continued exploration for and development of indigenous energy resources which are economically viable and technically feasible.
- Reduce the energy intensity while seeking to promote economic growth and minimize any negative environmental or macro economic impact on the economy.
- Establish and maintain an appropriate multi-sector regulatory framework to protect the consumer and to ensure that government's policy objectives are addressed.

Policy Recommendations with Respect to Generation Capacity Market Competition

- The legislation will place full responsibility for energy planning, including electricity planning, power studies, electricity demand studies and electricity least cost expansion plan on the Prime Minister's Office. The Prime Minister

(PM) however, will have the authority to delegate any aspects of electricity planning studies to the board or any other entity within the government. If PM finds the plan is unacceptable, the legislation will provide the PM with the power to state the deficiency and to request that the deficiency be corrected in a reasonable time.

- All new generation capacity to come on stream in future shall be the subject of competitive and a transparent bidding process.
- All generation companies with capacity of over 2 MW will be required to enter into individual power purchase agreement (PPA) with the government, generator with lower than 2 MW will be excluded from the PPA. These small generators can use their services for small industries and Planned Unit Development (PUD) development. It is necessary that these small generators meet all mandatory requirements of the power sector policies.
- In order to encourage investments in the generation sector the Government will define a framework for reviewing, selecting and approving projects. This is necessary as Independent or Private Power Producers (IPPs) are expected to take project specific risks without direct government guarantees.
- The basic principles governing the PPA and the interconnection agreement shall be set out with conditions that the insurance company certifies that all equipment installed for the plant are new and are covered by guarantees both on parts and labor for at least 2 years.
- Any new installation for the power plants must meet the mandatory fuel usage policy set by the government.
- The Government should stop buying electricity from private power producers at expensive market rate, and then selling it to all the consumers at a cheaper rate, costing thousands of crores Taka yearly loss. This practice will cripple the Power Development Board and the national economy.
- The Government should not encourage any more subsidized rates for commercial and industrial sectors. If subsidy is to be provided for some sectors on a limited basis, this subsidy can be tagged with their Tax return as Tax Credit, in other words, that sector can deduct that amount during their yearly Tax return. This process will further encourage businesses to return their taxes on time.

- The Government should encourage all industrial sector customers to upgrade their machinery, which will consume less electricity. Any industrial plant that employs more than 30 employees and uses heavy machinery that consumes electricity should submit energy audit report each year showing how they are reducing their dependency on electricity. Companies' fails to submit this energy audit report should be penalized. Subsidies on electricity price should be given only to those who comply with this clause.

Power System Master Plan

A basic requirement is that the government must be responsible for the development/redevelopment of a power system master plan. The Master Plan will serve as a guide to the future development of the sector and to provide an indicative position to potential private investors as to the capacity and investment needs in the sector.

The Master Plan will among other things consider the following:

- Energy demand forecast
- Supply and demand side management, especially demand side management as an alternative to physical expansion of new capacity
- Least cost expansion plan and the fuel mix
- Upgrading of the transmission and distribution system so as to reduce transmission loss
- Energy conservation aspect and energy audits
- Consideration and earmarking capacity generation from renewable and cogeneration sources
- Location aspects and site issues

Short -Term Goals

Although it is late but the present government is on track to meet the short-term goals. To meet the power demand present administration has advertised for about 1360 MW power generation system from public (830 MW) and private entities (530 MW as rental system for 5 years.) It is expected that the awards will be made by first quarter of 2010 and successful commissioning will depend on the quality of selected contractors. But this is not going to serve the nation to meet its immediate demand, especially for rural power for agriculture sector. Therefore, power rationing must be employed at least to

meet the public outcry. For power rationing purpose, government can take the following steps:

- Reduce power usage in administrative facilities, if necessary take out all heating and ventilation units from offices (AC and Heaters).
- Purchase small scale quick power projects, such as diesel power generators under 200 KW to minimize the demand on agricultural sector and plan to use them for other projects when the nation will be self sufficient in power supply.
- Increase the tariff temporarily during the peak season by at least 50% for large domestic users, who use electricity more than 600 KWh.
- Give incentives for low power users, who will reduce their electricity usage during the peak period (taking average bills of each month for the last 12 months to determine the stake point).
- Restrict operating hours in shopping centers, as employed before for the peak season.
- Immediately replace all existing lighting systems with energy efficient systems in administrative buildings, streets, parks and other public places.
- Evaluate each derated generator to find out what component of the complicated multicomponent power plant is limiting full production, and implement technical solutions to restore full production. In many plants it may be a relatively simple task, while for others it may be very complicated and not doable quickly.
- Install all the capacitors in stock, especially in greater Dhaka area, both in substations and distribution lines to improve power-factor. This helps in the delivery of more MWs from the existing generators and transmission lines.
- Streamline the transformer and circuit breaker repair facilities in Dhaka and Chittagong so that damaged equipment could be repaired quickly and put back to service.
- Each substation, distribution line and transmission line should be thoroughly checked for proper functioning now, so that they don't become the bottleneck if and when sufficient power generation happens within a few years as planned.
- Re-examine the policy of preferential allocation of power to Dhaka during severe shortages as most of it goes to supply luxurious residential areas, restaurants, shopping centers, and comfort items like air conditioners, microwaves, electric

irons, etc., while economically vital sectors like manufacturing, irrigation, etc. are shut down for extended periods through out rest of Bangladesh.

Long-Term Goals

In long-term goals GOB must add at least 1000 MW electricity every year in national greed without any interruption until it reaches about 9000 MW generation capacity. In addition, all existing plants must undergo overhauling process to increase their performance. GOB also should take adequate care for the improvement of its transmission and distribution capabilities.

New Policy Guidelines: Decentralization of Industrial Hubs and On-site Power Generation – Transmission Outwards:

- Develop a master plan for the industrial development considering decentralization of these industrial hubs out of larger cities. Develop power plants to feed them right in those areas, which will save transmission problem and will reduce both technical system loss and traffic congestions. These hubs should be developed with all necessary support systems, such as residential units, access to good schools/colleges, hospitals/health centers and entertainment facilities.
- Provide tax rebate, if necessary to those who will build their plants in those hubs, such as BCIC industrial hubs;
- Encourage all new plants to use energy efficient system in the production lines. Encourage them through tax credits, where necessary.
- Installer must provide certifications on low heat rate, minimum guarantee on labor and parts for 2 years for plants that will be owned by the government.
- Implement levy on new constructions, especially on Planned Unit Development (PUD) projects to offset additional energy generation cost.
- Institute private initiatives for large scale power plant with rent to purchase options for all large new power stations. These generators will enter in PPA for 5 to 10 years with the government and later the government will own the plant at a pre-determined cost.

System Loss

One of the major issues of the system loss is corruption. Large commercial and industrial users pay the power company employees bribes to avoid paying their large electric bills.

When a low to moderate income family cannot afford to pay their energy bills they also adopt the approach of bribery. A fair and equitable tariff system will reduce the corruption and the government will earn better revenue. It is recommended that the government reviews the following recommendations:

- Government's position is that system loss should be reduced to below 10% of generated power over the next five years.
- The new legislation is to carry tighter penalties to deal with electricity theft and fraud or for persons aiding and abetting electricity theft or fraud.
- Reduce political interference in implementing penalties on influential customers and strongly support the power company employees who tries to do their jobs properly.
- Government is to be encouraged to introduce smart cards in its payment system as is already being done by DESCO with meters developed by BUET.
- Government must take initiative on review and revise the existing energy tariff system to reduce the system loss. In order to achieve that an energy audit must be implemented and domestic minimum ceiling should be changed from 100 KWh to 200 KWh, and second one is from 201 KWh to 400 KWh (a mid level employee cannot run a family with less that 400 KWh). A reduction on minimum tariff will encourage consumers to keep themselves out of corruption. Increase the charge for those who afford to use air conditioning system, water pump and other exclusive appliances to off-set this revenue loss.
- Connect the electrical meters with central computer system to observe the usage of electrical power to all commercial and industrial sectors to reduce corruption. The BUET group has the capacity to design, build and implement it relatively quickly. Do not rely on expensive foreign consultants, which take a very long time to implement and restricts future modifications and expansions locally.

Generation and Conservation System for existing power plants

Bangladesh must work on efficiency development in existing plants and will find ways to conserve energy and reduce the demand at a certain rate every year. To achieve this goal, government can use the following approaches:

- Overhaul all existing power plants and maintain those to increase their efficiency. Encourage operating plants within 10,000 BTU/KWh heat rate for steam boiler and combined cycle plants. Existing inefficient plants should be

phased out once the nation comes out of the power shortage problem. In future, these types of inefficient plants should not be added to the national grid.

- Investigate and identify use of biomass and bagasse for power generation. There is ample scope to generate fuel by bio-generators using bagasse, rice husk, solid waste or other biomass. For example, government should encourage the sugar industry to produce electricity from its own waste bagasse. As a thumb rule, sugar industry can generate electrical power from its bagasse more than their current demand and the captive power can be added to the national grid, especially during the agriculture season. They can also use dual furnace bagasse/coal plant. Need to investigate other such industries, where their byproducts/waste can be used for power generation.
- Encourage self standing manufacturing plants, who generate their own electricity to enhance their capacity to supply electricity to the local grid. Many existing industries with their own generating capacity do not do so now and use electricity from the national grid as they do not have to pay the full amount due to corrupt arrangements with the power company employees. This way they do not have to buy expensive fuels for their generators.
- Encourage all end-users to replace their conventional light bulbs with high efficiency light *bulbs* and that will save energy consumption significantly. Encourage existing bulb making factories by providing low interest/tax credit to convert their manufacturing process with energy efficient light bulbs.
- Encourage use of energy efficient appliances by increasing and reducing taxes on import of electrical appliances. An increase in import tax on conventional appliances and reduction on energy efficient appliances will reduce the electrical consumption significantly. Government should develop energy star program following the standards of US and Europe.

Renewable Energy Policy for the Electricity Sector

- Government's policy is to obtain the maximum benefit from renewable energy, which is clean and eco-friendly and there is to be a statutory obligation on the part the government to promote renewable power.
- Government should set a target for the usage of renewable power and this Act will also give the PM the power to set and vary the target for renewable power from time to time.

- For all renewable and cogenerated capacity addition of 15 MW and below will be required to introduce a simplified procurement system and will ensure that such system is brought on stream in the shortest possible time. A renewable energy plant of 15 MW in operation may obtain a bulk electricity price based on both energy and capacity charge or on energy charge alone; depending respectively on whether power is offered on a firm basis, or whenever available.
- Cogenerated and small-scale producers below 2 MW shall be deemed *qualifying facilities*. A simplified system for interconnection shall be provided by the government and approved as qualifying facilities. Such qualifying facilities shall be allowed to interconnect to the national grid on the basic principles of a net metering agreement and a standard power purchase agreement of 5 to 10 years duration for this category of power producers. A cogenerated plant will be required to demonstrate that its combined efficiency for the supply of electrical energy is within the top 15% of the most efficient plants operated by the government.
- Government will provide a special tax rebate for special industrial technologies, which improves energy efficiency.

Transmission Policies

- In order to provide for efficiency in transmission and distribution, there is the need for periodic investments to upgrade the network system. Government will accord the highest priority to the reduction of transmission and distribution losses. Measures to reduce system losses may include:
 - a. Capacitor installation to achieve a system power factor of 0.95%
 - b. Voltage standardization to operate all primary distribution circuits at standard Kv,
 - c. Distribution trunk reinforcement for the primary distribution system to improve reliability,
 - d. Balancing of the distribution phases.
 - e. Checking and testing all currently installed capacitors for proper functioning.

Electricity Fuel Policy

What type of power plant will be most suitable for Bangladesh will depend on many factors, such as import vs own resources, projected demand, cost factor and

environmental issues. Based on review of records and worldwide energy and food crisis the following issues must be considered:

- Energy policy should call for fuel diversity and especially the substitution of cheaper overall cost alternatives in long run and reduce the reliance on imported fuel oil.
- The new fuel policy should be developed based on fuel security taking into account such factors as cost of generation, safety and the environment.
- The decision on fuel choice should be taken early so as to avoid the problem of low reserve margins towards the end of the decade. Government should make a decision on fuel issue and should be incorporated as a Fuel Standards for power generation plants in the country.
- Infrastructure cost for coal or gas, as a replacement to fuel oil shall be given priority, since Bangladesh is blessed with reserve of natural gas and coal.
- In coming decades energy will dominate the world economics, therefore, a huge increase in fuel price is expected. To overcome any type of catastrophic imbalance, Bangladesh government should invest heavily on identification and extraction of natural gas and coal for its use.
- Government should create national expertise on exploration and production technologies and import state of the art technologies to meet this goal. Although it will be expensive but it will pay-off in the long run.
- Initially government can solicit and retain foreign experts to operate these equipments and train Bangladeshi engineers. Provision should be made based on performance based contracting with hefty bonuses for successful projects.
- This policy discourages the Product Sharing Contracts for national resources.
- Government should consider best available technologies, geopolitical issues, cost data, and spent fuel issues before making any decision on nuclear power plant in Bangladesh.

Policy For Energy Efficiency/Demand Side Management (DSM)

- There will be the requirement for greater energy efficiency by commercial and residential buildings and this is to be integrated into the building code and made compulsory. The energy efficiency building code as part of the general building

code is to be made mandatory and brought into operation within the next 18 months.

- All new buildings over 10,000 rentable square feet must be designed with a provision of solar power system. For building under 10,000 rentable square feet in any new planned unit development (PUD), the total square footage will be considered as a single unit.
- All projected buildings in any PUD must demonstrate that the design has considered least dependency of power supply by the Government and recommend using energy efficient appliances.
- Government will develop an Energy Efficiency Monitoring Program built around appliance testing and labeling and the provision of information to consumers on energy efficiency ratings of appliances and equipment
- There is to be a target of at least 3% reduction in demand over the next 5-8 years for residential and commercial installations.
- Energy audits will be encouraged for commercial, industrial and institutional users through a voluntary agreement program. Essentially an agreement will be entered into between the Government and major end users, manufacturing or industrial firms or association of end users such as hotels, whereby the end user will seek to attain a certain level of energy efficiency improvement or energy consumption reduction, and government will in turn promise certain fiscal incentives and access to low cost financing. In this regard an Efficiency and Renewable Energy Fund will be established to provide concessionary financing to energy efficiency investments to industrial, residential and commercial users.
- The tax to be applied on energy efficiency devices, equipment and supplies will be such that it will ensure that the items are available to the public at the lowest possible prices and that the end user will want to invest in the most efficient end use device/technology. In this respect, lighting equipment, involving compact and circular florescent lamps, solid state electronic ballasts, high intensity discharge lamps; solar panels and tubes, solar water heater systems; photovoltaic and solar cells designed to produce electricity from the sun; day lighting systems; automated and electronic computerized control systems, including occupancy sensors and photo-cells for such systems; building energy management systems and power factor equipment are to be zero rated and import duty removed over the next five years.

- Government will set a target of 10 % reduction on public sector energy consumption over the next five years.
- Government will periodically carry out consumer guidance and public education programs to promote efficient use and conservation of energy.

Funding for Power Plants

AABEA recommends to create a fund for the power sector alone. It is also encouraged that a similar fund be created for other energy issues. This fund can be created with active help from non-resident Bangladeshi adopting the procedure outlined in Business module section of this report. Once Bangladesh government has adequate funding, International Organization will come forward with less stringent methods of loan.

TOPIC AREA 2: COMMUNICATION AND INFORMATION TECHNOLOGIES (IT) SECTOR DEVELOPMENT IN BANGLADESH

Background

This well-known topic area needs no introduction. The ongoing evolution of communication and information technologies (IT) is re-shaping the face of earth at every stage of human life. Bangladesh needs to keep up with the momentum and go ahead of others to tap into the opportunities that will continue to emerge out of it.

Recommendations

AABEA recommendations focus on the following areas:

1. Assist Bangladesh enhancing its business and health industries utilizing state-of-the-art communication technologies including IT and wireless **infrastructure** improvement, providing communication expertise and **educational** initiatives.
2. Assist collaboration between Bangladesh and other IT and communication technologies developed countries by knowledge sharing and cost-effective product development to compete in the overall Telecommunication global market; focus on both software, product and infrastructure development.
3. Gaining **market share** in the global market.

Our recommendation can be broadly divided into two major technical areas where Bangladesh can seek opportunities to develop its Business in the international market as well as communication infrastructure for its own development. These are:

1. Wireless Communication technology
2. Computer and IT sector
3. High-bit-rate Data transmission infrastructure

It is important to note that our recommendations are the results of numerous discussions with the NRB Professionals and incorporating feedback from the executives of corporate America who have lead several Government and private enterprises, and possesses sound knowledge on the state-of-the-art technologies. We outline four different broad areas where Bangladesh needs to focus on:

1. ***Increase high-tech business Investment and Export expertise in the communication sector utilizing programs such as the H1B visas available in the US:*** Wireless communication has recently become the back bone of many developing countries including Bangladesh. As a result there has been a tremendous growth in education and training for wireless technologies. This has opened up major business opportunities for many foreign countries that are looking for utilizing expertise in Bangladesh for cost-effective product development. India has pioneered in this area where IT chip development is a classic example. Several Internationally renowned companies such as HP, SAMSUNG, AT&T have already made large investment in India for design and fabrication of the IT Chips. We strongly feel that Bangladesh stands a unique opportunity to provide such service. For this purpose, NRB can also play an important part in coordinating with hi-tech industries and Bangladesh Government by acting as a bridge. It is fact that almost 60% of the design and fabrication cost belongs to expertise compensation. Thus foreign investors will be highly interested to invest their capitals in Bangladesh for cost-savings. However, proper business collaboration is needed for that. Again, once the expertises are developed, it can also be exported outside.

2. ***Enhance High-bit-rate Data transmission Infrastructure and Develop a sound Telecommunication Policy:*** In the present digital world economic and business success of a country is critically dependent on its data transmission infrastructure. This not only provides a vehicle for sharing information in the in-country business and economic environment, but also serves as a conduit for exchanging information globally. Recently Bangladesh has installed its Fiber Optics ring for in-country high-bit-rate communication. Use of this infrastructure can only be Bangladesh needs to increase its investment in this area to develop an end-to-end communication system. This may include fiber, cable and broadband wireless service such as Wimax at the receiving end. Combination of this service with wireless (mobile) service requires sound telecommunication policies, which will provide guideline for spectrum usage by issuing licenses for frequency usage. Bangladesh Telecommunication regulatory organization is presently responsible for developing such policy. This policy should not only reflect the present telecommunication infrastructure of the country but will also consider the application of future technology in the infrastructure. Again, NRB can provide an effective assistance to the Government both in the regulatory and technology sectors to ensure country's high-bit-rate telecom infrastructure is properly installed and operated with sound regulatory policies.

3. ***Deliver out-sourced consulting projects for foreign markets:*** This is one of the areas where our neighboring country India has pioneered. With the global growth in the areas of wireless technologies and computer sector there have

- been a tremendous opportunities for Bangladeshi engineers providing consulting services. Bangladesh has already achieved sufficient educational background in this area. With proper business relationship with foreign corporations and Government a business plan can be developed to identify the potential projects for different corporations. Again, NRB can play a critical role in developing this bridge. A coordination committee can be set between Bangladesh Government and NRBs in specific countries. Regular interactions between the NRBs and Bangladesh embassy can help generate a plan to develop close relationship for this type of programs.
4. ***Deliver offshore services, such as Data Entry, Call Center Processing:*** Providing off-shore service is another opportunity for Bangladesh to get market share in the high-tech business. Many developing countries are already enjoying this opportunity. This requires development of proper training and education programs. As this require close interaction with the foreign business environment, Bangladesh Government needs to develop strong business relationships with those countries both in the Government and private sectors. Again, for such case NRB engineers and scientists can play an important role to collaborate with Bangladesh Government and foreign enterprises. As mentioned before, in order to deliver proper services, there should be sufficient training program in the country. NRBs can also assist Bangladesh Government not only to develop proper curriculum but also help build proper institution that can provide proper certification.
 5. ***Develop and deliver packaged software:*** This is a tremendous opportunity for Bangladesh. Bangladesh can be involved in this business adapting two approaches. It can develop in-country software development enterprises with properly certified expertise who can develop high-quality software such as CMM level 5. Than with collaboration through Bangladesh Government business can developed with the foreign countries. As a second approach, Bangladesh Government can work with the private sector and coordinate with foreign software development enterprises and convince them to invest in Bangladesh for their own software development facility. Again, such investment will only possible when Bangladesh Government can demonstrate that we have qualified resource. Again, NRB can be highly instrumental in developing such relationships.

AABEA would like to help in whatever way the esteemed Bangladesh government deems appropriate in these targeted tasks. Here's a summary of the recommendations in five areas. These recommendations are tied up with the above categories.

1. Resource Development & Planning

- Establish concrete result-oriented guidelines governing different communication and IT courses
 - Develop educational programs focused towards market needs with up-to-date curriculum
 - Set up resources for industry best practices such as quality certification and project management
 - Develop a set-aside programs for major communication technologies initiatives with participation from educational institutions and local companies
 - Commission government wireless and IT projects to give local developers valuable experience
 - Establish Industry partnerships for academic offerings and co-op programs
 - Teacher training and utilizing NRBs for technology training
 - Involve NRBs for technology transfer
2. Focused Team
- Set targets for developing and exporting communication and IT professionals and revenue goals for out-sourced software development
 - Set up a dedicated team consisting of members from the Govt., RB and NRB
3. Infrastructure
- Partner with industry giants such as CISCO, AT&T to build infrastructure and software technology
 - parks attractive to customers
 - Extend the opportunities of IT to the masses by building publicly available IT resource centers
 - Improve communication infrastructure directly connecting to the Internet using high-bit-rate communication system such as Fiber, cable, WiMax etc.
 - Strive for over-all socio-political and bureaucratic improvements to attract and retain overseas high-tech Investment

- Deregulate Telecommunications and establish sound regulatory policies to maximize available spectrum usage for supporting wireless and wired communication services.

4. Business Promotion & Marketing

- Set up showrooms in developed countries by the help of NRB to demonstrate Bangladeshi expertise in this sector
- Promote our capabilities by creating appropriate marketing materials and a strong web presence
- Guide Bangladeshi companies to pool their resources in expensive overseas sales and marketing efforts
- Conduct Business conferences, seminars and industry summits in appropriate areas
- Partner with globally renowned consulting houses to build reputation
- Provide rewards and recognition for NRBs who bring their company business to Bangladesh

TOPIC AREA 3: BUSINESS ISSUES - ECONOMIC DEVELOPMENT AND FOREIGN LOANS

Background

It has long been observed that the 3rd world countries are suffering from lack of funding for its infrastructure development to enhance the quality of life and reduction of poverty. They are also dependent heavily on foreign and international loans and grants. These loans and grants are so segmented and are delivered with so many conditions that these loans/grants do not provide any meaningful impact on economic development, and rather put the country under enormous economic burden and debt. In addition, due to the interference of financial institutions, governments cannot function independently and eventually depend on foreign countries for any major decision making process although it may have nothing to do with foreign governments' involvement.

Budget deficit cannot lead the country towards economic development. The nation needs economic independence. Development budgets should be based on known sources of funding rather than expected sources, but it is very unlikely to happen. However, once *expected funding* portion is taken out from the development budget, donor agencies are likely to come forward with necessary funding without any or less conditions attached.

Our geographical independence is long been achieved. However, the country failed to achieve the economic independence. The Non-Residence Bangladeshi (NRB) community believes in communal harmony, political partnership, and value of democracy, and it wants to see the country to prosper. Political hegemony and bifurcation of the country based on political belief will only deteriorate the condition of the country. We all should come out of this culture and build a nation, what was termed as "Sonar Bangla", where all five fundamental rights of individuals will be protected.

Recommendations

Creation of Sector-Oriented NRB Funds

With time, the country has changed significantly and has improved its status in the foreign lands in many sectors. Thanks to the independence of the country, millions of Bangladeshi now live in various countries of the world. They are acknowledged for their hard work, talent, contribution to the societal and scientific advancement, efficiency, and intelligence everywhere in the world. These NRBs are contributing heavily to the nation's economy by sending about \$10 billion a year. This fund can be increased

significantly and to do that the GOB create specific funds for Power Sector; Agricultural Sector; Natural Resources and Mining Sector; Industrial & Infrastructural Development Sector and incrementally add new sectors based on the response.

To encourage NRBs to participate in these sectors, GOB may offer incentives on their remittance. Some ideas are as follows:

- Re-enact 15% interest on remittance deposited in the above referenced funds.
- Allow to pay at least 50% of the interest money in foreign currencies.
- Allow to withdraw the original deposit in foreign currencies after it matures.
- This fund can mature in two years.
- Depositors can withdraw their money on emergency basis before two years but have to pay a penalty of 6% annually.
- Earmarked funds cannot be reprogrammed for any other use.
- Approve a bill on this special funding in the National Parliament.

Once the program is initiated, all Bangladeshi missions should hold open houses to disseminate the information to mass populations to attract to this initiative. It is fair to assume that it will be easy to accumulate at least \$2.0 billion additional funds a year in the national coffer.

Development of NRB Funds in Housing Sectors

NRB funding can be tapped in the housing sector. It was observed that thousands of NRBs applied for residential plot and flats in response to the advertisements of the Bangladesh Government. In last 3 years, tens of thousands of NRBs applied for plot and flats in Dhaka city and over 95% of the applicants were unsuccessful. Their application fees are still lying with Bangladesh Government. This shows that there is an enormous interest among NRBs to invest in this sector. Based on the history, this is the only sector that the government is not losing money; rather, it is making profit. It will be wise for the Government to venture in this sector.

To increase NRB remittance, GOB should do everything to earn respect from NRBs. It was observed that many of the NRBs, whose remittances are the lion's share of forecign currency, are not getting proper respect and cooperation from GOB authorities when they visit Bangladesh, and invest there. No good response from the government body was found even when expatriate workers suffer brutality and or visa and work related

problems. It is essential that GOB keeps an eye on the expatriate welfare and take necessary measures to mitigate these problems. To get voluntary assistance from NRB, the government should:

- Work to command respect from NRBs.
- Create better environments for arriving NRB passengers in Bangladesh airports.
- Provide support to NRBs' investment and serve as a protector.
- Encourage NRBs to send money home without any type of bank charges.
- Reduce/eliminate fund transfer fee/processing fees of all incoming foreign exchange from NRBs.
- Ask the Bangladeshi missions abroad to provide quick response/assistance whatever needed to NRBs' calls.
- Develop a quota system to allocate residential/industrial plots and flats to NRBs and encourage them to apply for such projects.
- Instruct responsible authorities to release funds to NRB applicants who applied for plots or flats and were unsuccessful, quickly and without any bureaucratic maneuvering.

TOPIC AREA 4: TIPAIMUKH DAM AND ITS IMPACT ON BANGLADESH

Background

Government of India is undertaking Tipaimukh Dam project on the International Barak River in the state of Manipur, India which is located on the northern side of Bangladesh.

Bangladesh is a lower riparian state as the Barak River enters Bangladesh at Amalshid approximately 200 km downstream of the proposed Tipaimukh Dam. The Barrack River feeds Surma and Kushiya rivers that flow into the Meghna River, one of the three major rivers in Bangladesh. Therefore, the impact of such mega project demands a thorough review.

This project will generate 1,500 MW of hydroelectric power in addition to controlling floods of the Barak River. The Dam is 390 meter long, 162.5 meter in height and its estimated cost is Indian Rupees 5,163 crores. North Eastern Electric Power Corporation Limited (NEEPCO), a Private Sector Enterprise under the Ministry of Power, Government of India has been entrusted to implement the project.

Although, there is no vital needs for 1,500 MW of electricity for those part of India nor it will be economically viable to transmit the power to other parts of India, the construction of such a huge hydro power project raised questions to many experts both in India and abroad. Moreover, any type of obstruction on natural flow of water will always have negative impacts on downstream population.

Since it's an issue of the national interest, AABEA invited engineers and scientists with varied backgrounds in this seminar to understand this project from technical, economical, and social view points. Two papers were presented by two eminent engineers at the Silver Jubilee Celebration of AABEA at Rockville Campus of the University of Maryland. There was also a panel consisting of two experts on infrastructure and hydraulics and a representative of the Voice of America. The panelists reviewed the concerns and issues presented at the seminar including the influence of impacted flows on hydrologic, economical, cultural, social, and ecological balance of the nation. The panel further concentrated its review on impact of rivers and flows originated Tippiara Hills which ultimately discharging into Surma Basin. Panel also considered the severe shortage of food grains worldwide and its impact on Bangladesh since there is a shortage of arable farm land and this shortage is increasing every year. Based on presentations, discussions and numerous feedbacks both from NRB and International experts, all findings are compiled and recommendations are made solely

for the national interest of Bangladesh. It is the responsibility of Bangladesh Government to make decision considering facts but not the political interest.

Conclusions and Findings

The conclusions and findings are divided into three major phases of the project namely, the construction period; the commissioning of power plant, and the operational phase of the project.

A. Project Construction Phase

The natural flow of water will be stopped or be diverted during the construction phase of the project. For economic reason, the construction company could adopt a method of dam construction that may include diversion of water or construction of tunnel for flow control. If they choose diversion of water to areas outside the flood plain, there will be no flow to Bangladesh. If the construction company chooses to utilize cofferdam or other method of flow control, it will cause tremendous amount of low flow during construction. They can also divert the water to downstream using small channel that will cause reduction of flow to Bangladesh. If proper attention is not given during review or contract negotiation and precaution is not taken during the construction phase there will be no flow or a very small flow downstream thereby will be a significant negative impact on life and economy of Bangladesh. This impact will be for several years as construction of the dam will take few years which could be as much as five to seven years.

B. During the Commissioning of the Power Plant

India will impound water to accrue full benefits of power generation, based on the historical data of precipitation and water discharge through Barak River the filling up the of the reservoir will take 1.25 years in normal rainfall and in case of dry monsoon, it will take 2 years. During this reservoir filling period there will be no flow, or very minimum flow to the downstream, thereby will have a devastating effect on life and economy of Bangladesh. There is no reason why the operator of the power plant will take time to enter into power generation with its full efficiency.

C. During the Normal Operation of the Plant

Experts reviewed the impact of the project in Bangladesh after the project commissioning from the following aspects:

- a. There will be increased water flow during the winter months

- b. There will be about 30% reduction of flow during the monsoon and flooding season.
- c. It is anticipated that during the time of boro harvesting, the reservoir level had to be lowered to prepare the reservoir to receive excess runoff during monsoon period of heavy rainfall. This will cause sudden and unexpected riser in water level during pre-monsoon time, the time of boro harvesting. This will have significant impact on rice cultivation.

The findings related to this phase are as follows:

- The increased winter season flow will inundate a significant amount of arable boro crops within the Haor and Beel Basins of the Greater Sylhet, Greater Mymensingh, and Northern Brahmanbaria Districts. This inundation will cause a loss of a significant amount of rice and has the potential to impact the food security of Bangladesh. Inundation also has the potential to displace traditional families and landowners. Economical devastation will also increase unemployment and is a potential indicator for anarchy and terrorism, which has no boundary.
- The dam will detain and retain the basic ingredient of nutrition of sediment. A lack of natural replenishment of organic nutrition will have negative impact on both agriculture and aquatic life. It will have a tremendous negative impact on nature by deforestation in the downstream area.
- The possible higher post-spring flow through the dam (to prepare for reservoir for flood flow during monsoon rains) will further complicate harvesting boro rice as boro rice requires three to four weeks of dry land for the rice grain to mature and ripen. Therefore, Bangladesh will suffer from increased food shortage.
- The increased dry season flow will inundate the areas from where sand, gravel, and cobbles are extracted for use as construction material from Chunaroghat, Tamabil, and other areas. Infrastructural construction cost will increase putting pressure on national development budget.
- The dam will reduce flood flow by 30%, which may have a beneficial impact. However, it will not flush all the chemicals/contaminants out of the stream corridor, which is causing environmental degradation. This will put extra burden on national health care issue.
- The reduction of flow will affect the flow vector of Padma-Meghna at Chandpur and has the potential to have Padma flow wipe out Chandpur and adjacent

valuable and highly productive irrigated lands within the Chandpur Irrigation Project. Salt water intrusion, reduction of food growth and unemployment might shake the backbone of the nation.

- The reduced flood flow and increased winter flow will improve navigation and irrigation in some areas and have the potential for flushing salt water intrusion from the Bay of Bengal into the Meghna River, which will have significant problem for the nation.

The project could be turned into a win-win project if the above conditions are researched and a baseline survey is made.

Recommendations

1. Tipaimukh Project should not be constructed without a full treaty with Bangladesh.
2. The treaty should be modeled like Indus Water Treaty under the auspices of World Bank or United Nations and the treaty must assure that no water will be diverted by India from the Barak River.
3. The treaty should spell out the operational aspects of the Dam. The operation of the Dam shall not cause widespread inundation of boro crop and release of the water from dam shall not inundate boro crop. In addition, an operational aspect of artificial flooding by pulsating flood of the Sylhet/Mymensingh area to create artificial but controlled flood during rainy season to flush the Haor Basin should be included. The frequency and amount of the pulsating flood should be determined by full hydrologic study of the area by the Bangladeshi experts.
4. India shall not construct Phulertal Barrage ever to divert water.
5. India shall sell power to Bangladesh from this project on a long term agreement basis.
6. Bangladesh should use technical review irrespective of any political pressure and should set up commissions, comprised of national and international experts to review the project from technical, socio-economical, ecological, and environmental aspects.
7. Bangladesh government should take lessons from impacts of large international projects throughout the world (impacts before and after) to have a first-hand knowledge on consequences of such projects.