

Thrust Sectors

An alternative vision of energy

by Ekram Kabir

POPULATION PRESSURE AND INDUSTRIAL GROWTH have vastly increased the demand for energy in Bangladesh. Fossil fuels like coal, gas, and oil are finite resources, exhaustible at some point in time or the other. So there has to be a sense of urgency to look for alternative sources of energy. Specialists in alternative sources of energy, such as solar, biogas and wind, were interviewed to have a fuller picture on the prospect for these.

Dewan A. H. Alomgir, general manager of Grameen Shakti, on SOLAR ENERGY: 'Although significant technological advances have been made in the fields of solar photovoltaics (PV), wind energy and bio-gas technology, yet for remote rural areas where there is no infrastructure for conventional energy supply, moves to introduce these forms of decentralised alternative energy systems have been far from expected. These sources would be far more adaptable in the future.'

Energy being the mainstay of industrial development, use of fossil fuel such as oil and gas for energy needs has a cost which is related to pollution, to environment and to human health hazards. If these cost are represented in the energy-pricing calculation for fossil or for that matter nuclear sources, then the cost would be much higher than nonconventional sources of energy such as PV and wind.

With the increasing demand for energy supply in one hand and with decreasing resource in fossil fuel on the other, much interest has been focused by both the developing and developed countries to harness alternative energy resources during the last two decades. There is practically an unexplored field for development of electrification programme. A wide gap remains between the energy availability and demand. Renewable energy sources till date, could not play any vital role to fill this gap because of cost-effectiveness and proper institutional and financial support. Bangladesh is thus far behind from its neighbours from the expected level of renewable energy development activities. But time has come to design all possible mechanisms for the future and implement the same soon.

We, at the Grameen Shakti, have been implementing PV programme for rural applications for the last three years. The main activity under its PV programme is installation and financing of solar home system in the rural areas. Up to November 1999, we installed 1651 systems with 79.14 kWp

installed capacity. We have installed system in the range of 13W to 215 Wp for different applications like lighting, operating televisions, computers and cellular phones, heating soldering iron for repairing radios and televisions. However, the applications are overwhelmingly for household purposes - lighting and for operating television. Business units and educational institutions are also trying PV systems to extend their working hours in the evening. PV systems in some cases have also become sources of additional income. For example, some customers are extending working hours in shops, restaurants and saw mills. PV systems are used for heating, soldering iron, providing telephone services in the neighbouring areas. In some cases PV system owners sell power for monthly bills to the shopkeepers. The number of income-generating applications are still small compared to household applications, for improving the quality of life. And the number is on the rise.

However, lack of awareness about the technology can be a major bottleneck for fast expansion of this system. It has been found that rural customers take purchasing decision only after gathering certain level of confidence about the performance of the PV systems. Keeping all this in mind, several PV systems have been installed, meetings have been arranged in villages, bazaars and in institutions to generate awareness and to market the systems. We provide daylong orientation training sessions to customers on minor maintenance problems, and we also train local people to become technicians.

Kazi Akhtarruzzaman, project director, Biogas Pilot Plan Project, Institute of Fuel Research and Development, BC-SIR, on BIOGAS: 'Biomass is another important source of renewable energy. Wood, straw, leaves and cow dung are the common material used for cooking in the rural areas. This creates health hazards and indiscriminate cutting of tree for producing firewood. This has created enormous environmental problem. Cow dung can be effectively used to generate clean cooking fuel by using biodigester. The residue of the biodigesters is a better fertiliser for crops and a better feed for fish. So the application of biodigester can truly be very useful to produce cooking fuel and fertiliser for farm and feed for fish farming.'

Biogas is a kind of fuel-gas obtained from anaerobic decomposition of organic matter such as cattle dung, poultry droppings, human excreta, agri-

cultural residues, water hyacinth, garbage etc. The technology is simple and consists in preserving the wastes out of contact with air and collecting the gas from the top for use. The gas is used for cooking, lighting, running engines, generation of electricity etc. The residue left after gas evolution is a good organic fertiliser rich in NPK and micro-nutrients. We are in a favourable position in

respect of the climatic conditions and availability of the raw materials for biogas production. The optimum mesophilic range for biogas production is 25°C-37°C. We, in Bangladesh, are blessed with this range of temperature almost throughout the year.

Besides fuel and fertiliser, biogas technology provides better hygienic conditions in the

rural areas. Disposal problem of human excreta in the rural areas are well known. Latrines just on the other side of the bank of household are still a common scene in rural Bangladesh. Piling up of cattle dung in the house courtyard spreads putrid odour and creates a breeding ground for mosquitoes and flies. These factors coupled with dropping of human excreta anywhere

makes the environment unclean and unhygienic and prone to various contagious diseases. On the other hand, when these wastes are put into biogas plants, these problems are completely eliminated. It has been found that most of the pathogens present in the excreta are killed when passed through biogas plants. Since anaerobic fermentation kills the ova of mosquitoes and flies and

that restricts their multiplication and therefore the malices from blood fluke, hookworm and epidemic intestinal diseases could be greatly reduced if offals, dung and excreta are fed into the digester. The eliminates drudgery and thus ensures better sanitation and controls pollution. We are promoting biodigester to produce both clean burning biogas and residues to be used in the field as fertiliser or in the ponds for fish cultivation.

There certain experiences like biodigesters with polythene, with a view to reduce cost, faced several problems in the past: polythene biodigester needed two cows to obtain gas. But the availability of cows could not be ensured at all levels. And polythene biodigesters were weak, and insects damaged many of those. Flood water in the northern districts also damaged many biodigesters.

Success of biodigester, however, depends on two factors: availability of five cows by a potential consumer, and for those organisations which are financing schemes so that the buyers can pay the price of digester in installments. Problems regarding cost and habit can however be overcome, but regrettably the 'will' to popularise the use of biogas is absent at the leadership level.'

Dr. Miftahur Rahman, Optical Physicist, on WIND ENERGY: 'The objective of the wind energy should be to provide electricity to the food producers so that they can enhance their profit by increasing production. The electricity so produced will be stored in battery bank that will be used to charge batteries to provide electricity to light houses. However, the present phase of wind energy programme allows to gather practical data on the basis of which the future expansion in other places in the coastal areas could be done. Bangladesh has a long coastal area. The average wind speed available in the coastal areas is more than the minimum speed needed to operate wind turbine to generate electrical energy. To remove hesitations, we can approach with the hybrid systems. The transfer of electricity from a large power station requires very expensive distribution systems or grid lines to carry it to far away distance. It may not be economic to extend the grid lines to remote and isolated villages, islands, mountain terrains. An alternative solution to this problem is to install mini and/or micro power stations using multiple power sources to form the hybrid systems - a

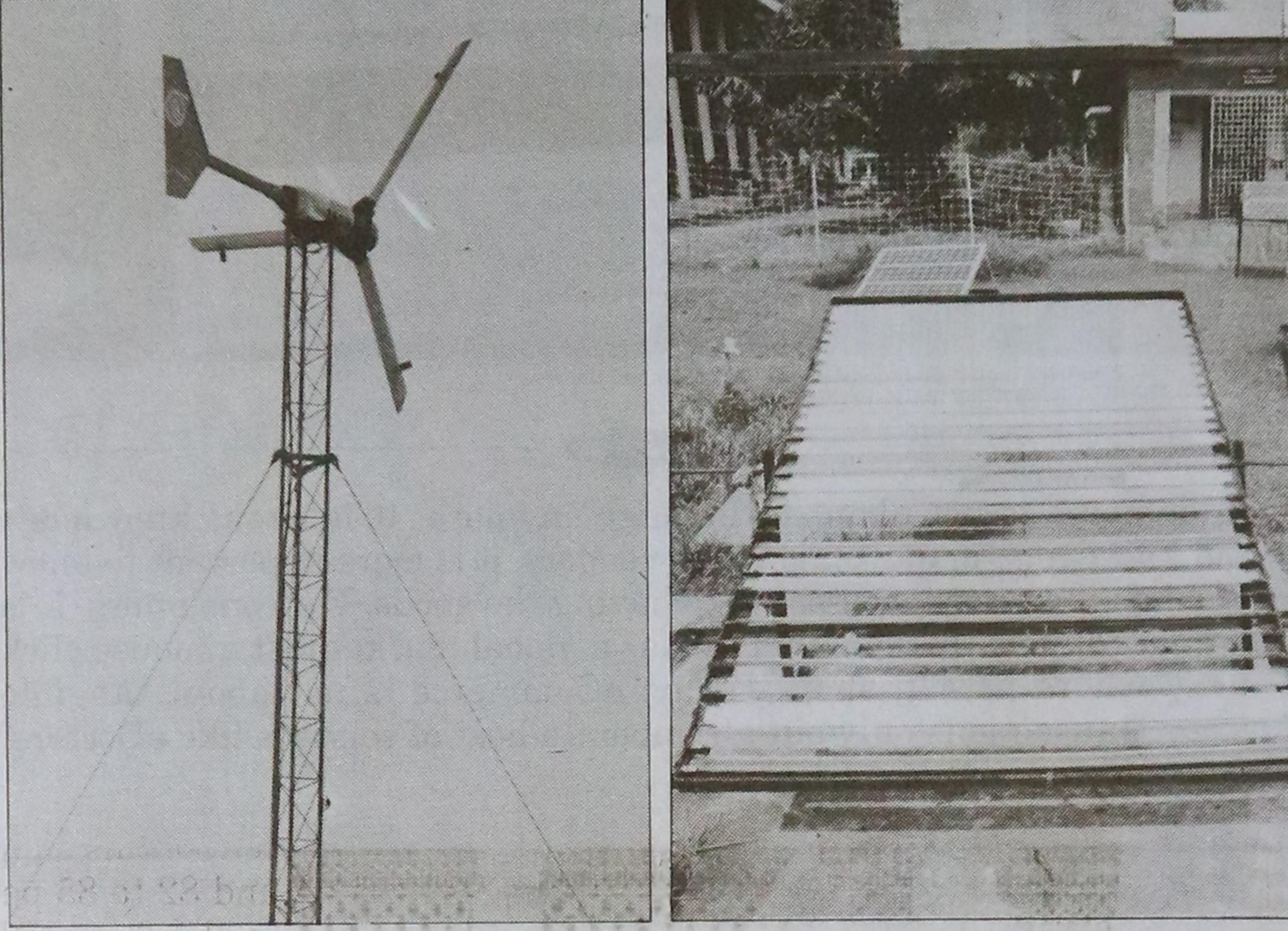
combination of wind turbine, diesel generator and solar modules.

Research is going on with the possibility of developing wind power systems to utilise wind energy in the coastal areas of Bangladesh. There have been some organisational success stories. Grameen Shakti, for example, has installed two anemometers, one on the roof of Sitakunda Cyclone shelter of Grameen Bank and one in Chokoria with automatic data loggers for wind resources assessment. These are very small systems operating on 300 watt and 1 kilo watt.

Wind energy can be economically more competitive than PV in areas where annual minimum average wind speed is more than 6 m/sec. To satisfy the need of electricity of our rural people, solar PV, wind turbines and conventional generators may be integrated to form hybrid systems that may provide them with the benefit of electricity with a most dependable and economic manner. The reason of integrating solar PV and wind turbine with a conventional generator is to reduce the effective load on generator.

Some of the important applications of a typical hybrid system are for battery charging, lighting, communication, desalination, ice-making and refrigeration. It may be worth while to assess the technical feasibility of adopting hybrid systems for our rural electrification, especially in the coastal regions and islands where average annual wind speed may be sufficient to make wind/solar/diesel hybrid system an economic solution to their electricity demand. The hybrid power technology may help in creating a technological infrastructure with possibility of local production of various components. Thus it will help to reduce the cost of the systems. And hybrid power systems are not only solutions for our rural electrification - it may as well be used as back-up power systems for our large number of garment factories, restaurants, shopping centres, hospitals, schools located in the urban areas. The problem of loadshedding may be minimised with the adoption of hybrid systems of different choices. The important issues of consideration include solar and wind resource assessment, technical training and economic analysis system design, project monitoring and evaluation, financing mechanisms and industrial interactions.

But there is no systematic initiative to harness these best fits for the poor. The government has to consider all options possible to meet the growing need of energy.'



Constrained by limited mineral resources, wind and solar energy seem to be easy options

Imperatives for stronger South Asian co-operation in IT

Continued from page 12- the citizens divided, demoralised and hence away from the fruits of cyber co-operation. Which direction we will move, will, of course, depend on the level of mental preparation of the leaders who are supposed to instil the millennium vision into the minds of their citizens. Besides vision, the outcome will also be dependent on the commitment of the South Asian leadership for not only developing the infrastructures related to communication, particularly information, science, technology and education but also on their efforts at expanding the scope of access to these opportunities for the ordinary citizens. Will they be prepared to hear the voices of the people and respond to their calls positively in the days to come?

However, everything will depend on how the South Asian leadership responds to the new opportunities through focusing on the right mix of policies and committed actions.

Despite nearly fifteen years of existence, the South Asian Association of Regional Co-operation (SAARC) has not been able to change the mindset of the policy makers of the region for effective co-operation in the hardcore field of trade and investment. There was no lack of support for such a co-operation from the ordinary people who still have a strong bias for a South Asian identity. Their leaders, however, could not live up to their expectations. Contrary to this dismal outcome in South Asia, the South East Asian leaders have been able to

demonstrate quite successfully the model of regional co-operation despite the presence of many contradictions in that region. The co-operation in the area of multi-media, telecommunications in addition to hardcore areas of industrialisation speaks eloquently the willingness of the leadership for leapfrogging the region into a developed status. The political commitments, policy co-ordination, exploitation of economic complementarities and perception of shared benefits have all worked towards a synergy facilitating active regional co-operation. Moreover, the commitment of the leadership for transforming the Southeast Asian society into an information society, particularly in Singapore and Malaysia is indeed striking. Other countries of the region too are benefiting from those pockets of informationisation. The condition in South Asia has, of course, been not that conducive for greater co-operation despite pathetic state of human development in this region. South Asia is one of the poorest regions with striking inequalities between rich and poor, male and female, different regions and different ethnic groups.

However, there are a number of constraints which have been working against such co-operation including: problems of state formation and conflicts of nationalism, erosion of trade linkages and increase in external dependence and Indo-centric strategic perceptions in South Asia.

Of course, since the end of

cold war, a number of sources of security apprehensions in the region have already been eroded and a better political environment for regional co-operation does now exist in South Asia, despite military take-over of the government of Pakistan. However, many of the irritants could be easily avoided if South Asian states made sincere efforts at resolving some of the outstanding bilateral problems.

As already indicated earlier, the level of infrastructural development in the field of communication, information and

when a Caretaker Government was in place. However, the IT consciousness has significantly improved among the policy makers in Bangladesh. The government has been openly supporting policy moves to strengthen IT sector. A high-level Task Force led by Professor Jamilur Reza Chowdhury of BUET has already identified major areas of policy intervention. But Bangladesh has not

to be managed with greater efficiency and vision. The potential for Internet-based commerce is immense. Bangladesh has to go a long way in expanding the Internet development. It can benefit immensely from the early gains of India in this field. It is expected that half the people of the world will have Internet connections by the year 2003. There were 15 million Internet connections in 1998 in Asia.

will be a meteoric rise in the number of users of Internet in Bangladesh, with significant impact on the economy. Dr. Muhammad Yunus, the founder of Grameen Bank, has predicted that given appropriate support IT related activities alone can double the GDP of Bangladesh in another ten years' time. This can be used in software development for boosting export, as well as for improving the condition of our living through providing better health services, educational facilities.

Finally, we can say that the policy makers in South Asia should rise above their narrow elite interests and work towards creating a learning society which can fight poverty using home-grown strategies. South Asia is the seat of many successful experiments and innovations. The challenge is to create a South Asian Mind for fighting the menace of poverty utilising appropriate tools.

These should be modern and yet South Asian. They should aim at transforming the poor as source of a larger market, recognising the existing knowledge gaps and trying to develop new spaces for participation and innovation which can be gainfully utilised for poverty eradication. The political elite of South Asia must be prepared to provide the vision to look beyond short term interests for a harmonious, mutually beneficial and regionally stable South Asia which can take advantage of the emerging technologies for poverty eradication.

If South Asia really wants to use IT for poverty eradication, SAARC can take an initiative to establish a South Asian IT Centre which will be exclusively working for poverty eradication. This can then work as a network for the very best people involved in IT, investment, politics, foundations,

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While some progress have been made in resolving a few of the bilateral problems such as Indo-Bangladesh water sharing of the river Ganges, the resolution of the Chakma refugees problem, the tension heightened between Pakistan and India due to Kargil episode relating the Kashmir problem. There are still some irritating bilateral issues between India and other neighbours. Notwithstanding these problems the South Asian mind must be able to think long term and opt for effective co-operation if not

science and technology is far from satisfactory. Although nearly fifty per cent of the adults in South Asia are 'literate', their access to modern means of communication is indeed very low.

Unfortunately, the Government of Bangladesh failed to get an access into the information superhighway which passed through the Bay of Bengal mainly because of its lack of sensitivity towards IT. The government even hesitated to introduce Internet system. This was introduced only in 1996.

yet been able to position itself strategically in the South Asian regional context.

So, there is certainly a need for greater policy co-ordination and co-operation at the South Asian level in order to reap the benefits of IT. Such a co-operation can be achieved only if South Asians realise the need for greater complementarities of infrastructure which used to exist earlier. New opportunities to be shared liberally.

Being for development in the present time, knowledge needs

This will go up to 64 million in 2003. The Internet connection in India jumped to 300,000 from 150,000 from 1997 to 1998 which may go up to nine million in 2003. In Bangladesh, there are at best 30,000 Internet connections now. This may go up to one million by 2003. But to achieve this goal, we need to increase the telephone lines dramatically, have access to the existing fibre-optic backbones (now denied by the bureaucratic complexities) and reduce the fees for Internet user drastically. If all these are done, there

eCommerce - a global opportunity

Continued from page 13- the goods as opposed to having the goods. For consumers, it

is a great comfort to know that he has a global market just a mouse click away where he can

shop. Today, eCommerce is not about tangible goods transactions only but also about a host

of services like eDoctors, eLawyers and eAccountants. The prediction is that communication is going to be free and the speed of Internet is going to increase to an extent where there would be no bandwidth restrictions. The world is going to be one online community connected together with mobile phones using the Wireless Application Protocol (WAP) technology. Majority of all online transactions would be done through mobile handsets.

Bangladesh as a nation should focus on the area of eCommerce providing a broad range of services. A help-desk for an online business in the West can be located in Dhaka. Similarly, call centres and back-office maintenance functions can be based in our coun-

