

Globalisation and engineers of developing countries



MUHAMMAD HABIBUR RAHMAN

GLOBALISATION is the subject per excellence for the engineers. The engineers have all through played a significant role, though never dominant one, in the globalisation process.

With the discovery of America globalisation began in the fifteenth century. At that time European incomes were not much higher than those in China, India, or Japan. According to the economist Angus Maddison, Europe's economy grew around 0.07 percent a year until 1700; only after 1820 did it reach one percent. But the pace of technological and institutional innovation accelerated thereafter. Once the European countries were in the lead, they were able to continuously increase their edge through technological advances.

The Chinese discovered and pioneered the development of clocks, the printing press, gunpowder, and iron, but they had not had the external competitive stimulus to promote economic development. Japan sealed itself off from external influences for more than 200 years. India never developed an effective national state prior to the colonial era.

Most of Europe's leading powers did not rely on private initiative alone but adopted mercantilism to promote their development. Although the United States enjoyed success with such a strategy from 1790 until 1940, no developing country has a home market large enough to support a modern economy today. The other successful early growth model was European mercantilism, namely export promotion, as pioneered by Venice, the Dutch republic, Britain, and Germany. East Asian success stories are modern versions of the export-oriented form of mercantilism. Today, of course, such strategies are condemned as violations of global trade rules, even for poor countries.

Rich countries preach free trade to the poor while lavishing over \$ 300 billion a year on their own farmers. Poor countries that are best suited to produce food and textile are denied the markets in rich countries. The world needs a more pragmatic, country-by-country approach, with room for neomercantilist regimes until such countries are firmly on the convergence track. Poor nations should be allowed to do what today's rich countries did to get ahead, not be forced to adopt the free trade or laissez-faire approach.

The traditional advantages of poor countries have been in primary commodities (agriculture and minerals), and these categories have shrunk from about 70 percent of world trade in 1900 to about 20 percent at the end of the century. Rich nations who laud liberalism and free markets are rejecting those

very principles when they restrict freedom of movement.

Europe's rise was partly due to the creation and diffusion of technological innovations and the gradual accumulation of capital. But the underlying causes were political and social. Many of today's developing countries still lack government accountability, scientific enlightenment and upward social mobility -- the factors crucial for economic transformation.

Theoretically globalisation offers opportunities for all nations, but in practice most developing countries are very badly placed to capitalize on them. These are bad climates, limited access to navigable water, long distances to major markets, and unchecked population, very unequal income structures inherited from colonial regimes and stagnant patterns of income distribution, the greatest but disadvantage has been the poor quality of government. The economic decline stems from their failure to maintain effective states and ensure the rule of law. Income growth of most of the developing countries depends heavily on the legal, administrative, and political capabilities of public actors in sovereign states.

Kenneth N. Waltz said in 1999 that the interdependent of states "has increased, but only to about the 1910 level if measured by trade or capital flows as a percentage of GNP; lower if measured by the mobility of labour, and lower still if measured by the mutual military dependence of states. Yet one feels that the world has become a smaller one. International travel has become faster, easier, and cheaper; music, art, cuisines, and cinema have all become cosmopolitan in the world's major centres and beyond."

High-technology jobs can be brought to the workers instead of the workers to the jobs; foreigners can become part of American design teams without leaving their homelands.

According to him "globalisation is not global but is mainly limited to northern latitudes. What looks smooth, uniform, and simple from a distance, on closer inspection proves to be pock-marked, variegated, and complex. Yet here, the variations are large enough to sustain the conclusion that globalisation, even within its zone, is not a statement about the present, but a prediction about the future."

In an article the *Accidental Conqueror* published in *Discover*, December 1989 Jared Diamond, a professor physiology said "No convincing evidence of genetic differences in mental ability among peoples has ever been found despite considerable effort. Technological differences among peoples have led to great tragedies in the past 5000 years, and the legacies of colonialism and conquest still powerfully shape our world today."

According to him, "Europeans' conquest of America and Australia was due not to their better genes but to their worse germs (especially smallpox), more advanced technology (including weapons and ships), information storage through writing, and political organisation -- all stemming ultimately from continental differences in geography."

Due to globalisation there has been a world-wide increase in domestication of animals of and that

of food plants, the two basic props of civilisations. We have globalisation on our table Professor Diamond pointed out, "A typical American meal might consist of chicken (of Southeast Asian origin) with corn (from Mexico) or potatoes (from the southern Andes), seasoned with pepper (from India), accompanied by a piece of bread (from Near Eastern wheat) and butter (from Near Eastern cattle), and washed down by a cup of coffee (from Ethiopia)."

may make a humble beginning by making higher investments in research. The creation of consortia comprising research universities, government laboratories, and private industry; and the establishment of centres of excellence that can bring together capabilities in theory, computer modelling, specialised experiments, and diagnostics will take longer time. Meantime, let us keep ourselves up-to-date. Japan has been placing their most talented engineers in production.

is not a golden win-win situation. Roughly one billion people earn less than \$1 per day, and their numbers are growing. If today's global opportunities are far greater and potentially more accessible than at any other time in world history, developing countries are also further behind than ever before. Realistic political logic suggests that weak governments need to show that they can manage their affairs much better before they pretend to have strategic ambitions.

Chernobyl killed outright 31 persons and almost all others were exposed to radiation levels the biological effects of which are ambiguous at worst.

Alvin M. Weinberg in his article on Technology and Democracy, published in *Minerva*, Spring 1990, said, "Although it cannot be claimed that science or technology originated in democratic societies, yet indirectly, democracy seems to be indispensable for technology to flourish. Democracy is more con-

positive components could be utilised for the betterment of the human being. Greed, selfishness on the one hand and cooperation and love on the other are common phenomena of the global order and the economists should formulate the development policies keeping in mind the existence of these elements. Arrow was replying to a question on the effect of globalisation at a seminar on "Sustainable Development and Economics of Poverty" jointly organised by the Bangladesh Institute of Development Studies and North South University.

Another Nobel laureate Joseph Stiglitz has recently stated that Nobel Prize of 2002 has celebrated a critique of simplistic market economics. Laureates of 2001 emphasized that different market participants have different (and imperfect) information, and these asymmetries in information have profound impact on how an economy functions. In particular, the laureates of 2002 implied that markets were not, in general, efficient; that there was an important role for government to play. Adam Smith's invisible hand... the idea that free markets lead to efficiency as if by an invisible hand... is invisible at least in part because it is not there."

At the core of the global divide is the vast inequality in innovation and diffusion of technology. Globalisation policy has barely scratched the surface of this central problem. Jeffrey Sachs has pointed out about 15 per cent of the earth's population provides nearly all of the world's technology innovations. Perhaps half of the world's population is able to adopt these technologies in production and consumption. And around a third of the world's population is technologically disconnected, neither innovating at home nor adopting foreign technologies.

He has said, "Technology is less likely to converge than capital. Free markets are not enough: successful innovation requires supporting institutions. Successful innovation requires academia, government and industry to work in harness. In developing countries, fruitful interaction of this kind is unheard of. Few governments even have a science adviser. Many economists assume that all developing countries are equally well placed to absorb technologies from abroad, but this is wishful thinking."

According to Jeffrey Sachs countries that do not keep up with global technology often collapse, unable even to maintain their standard of living, much less increase it. Perhaps 2 billion people or more will fail to share in the benefits of global growth without a complete change in international strategy.

All States should co-operate in the establishment, strengthening and development of the scientific and technological capacity of developing countries with a view to accelerating the realisation of the social and economic rights of the peoples of those countries. The international community should make a firm commitment to promote scientific and technological capacity in the poor countries. As part of this, rich countries should exercise restraint in the use of property rights and pay more attention to the U.N. Declaration of 10 November 1976 on the Use of Scientific and

Technology Progress in the Interests of Peace and for the Benefit of Mankind.

Engineers will have to join forces with biologists, chemists, meteorologists, economists, planners, political scientists, ethicists and community leaders in unprecedented ways to lead society on a sustainable path. They must play a much stronger role in the public policy process to provide the right incentives for industry and others to move on a sustainable path so that engineers can be encouraged and supported to design sustainable technology.

To succeed in professional practice in the future, the engineers will need to understand how business is practiced in other countries how engineering is practiced in other countries, and what other societies expect of our products and services.

While engineers are involved in the implementation of public policy decisions pertaining to planning, designing, and constructing a nation's infrastructure, they are very often not involved in the development of the public policy even though it affects them acutely. Engineers therefore increasingly need to acquire proficiency to assess, priorities and meet the needs of several stakeholders simultaneously. It would be useful and proper for a mix of disciplines -- engineering, social and physical sciences, law, etcetera -- to be applied to the management of the water resources, working in true multi-disciplinary fashion.

Opportunities for growth in the world market have shifted to knowledge-intensive area of the rich countries and most of the poor nations are peripheral players in the knowledge-economy. We are the hewers of wood and drawers of water of globalisation. We bear the dross of globalisation -- old cars and computers and various dangerously toxic wastes. We are the partners in joint ventures where we are persuaded or compelled to sign on unequal treaties and buy our own natural resources at inordinately high price and that, again, paying in scarce foreign currencies.

For the engineering profession as a whole it is not a case of supporting globalisation or opposing it. The rational view is to accept it as an emerging and powerful global reality, and to formulate strategies to manage it to minimise the adverse effects and maximise the gains from it.

In our country the engineers have the same image like other professionals have. And that image is not good. It is not commensurate with their merit and standing. The engineers deserve more than they receive. They themselves know well the problems of their image. They can only win the heart of the people by dedicated service.

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The improvements in transportation alone have enabled rapid migration of large numbers of people all over the world and increased the volume of raw materials and finished products in international trade 800 times, fossil fuel 30 times and industrial production 100 times in the last century. The population of the world has more than doubled to 5.9 billion people and the world's economic output has increased fivefold. By the year 2005, for the first time in history, more people will live in urban than in rural areas.

Lately, technology has been the main driver of globalisation. Many of the issues they raise reflect popular concern about the hard edges of globalisation--fears.

Claire Melamed of Christian Aid, London in a letter to the *Economist* October 21st 2000 said: "Many African countries are highly integrated into international trade, their export earnings account for a higher percentage of GDP than that of many industrialised countries. However, GDP per head in sub-

We are to evolve some measures so that there could be more collaboration between the engineers and the industries. We must clear existing statutory and administrative roadblocks to the application of the new technologies. Nobel laureate Amartya Sen suggested that one of the causes for the success of the Indian computer industry is that it has suffered from less legal hurdles.

More than eighty percent of the people live in villages where electricity is either absent or inadequate. We are looking forward to the future when the solar energy or bio-gas can hopefully be harnessed for producing cheaper energy. Light produced by electricity or solar energy, may help to secure an education; power mills, workshops, phones and fridges and plug in the most remote rural backward into some of the supported benefits of global economy. A solar panel pulsing may power a computer in a remote school. It may be the beginning of the change from subsistence to surplus. The drift to the city slums

The driving force for the recent changes in the modern engineering education is the globalisation of economy society, industry and education. In Bangladesh we shall have to work for an entry in the global educational market on a broader basis. We are to redesign our engineering programmes to include more international content and adopt international standards. The new engineer is to fulfil a professional file: the technical-administrative side as well as the psychological side. He is not only to keep updated with everyday changes in the technology, but also to learn and adjust fast to new administrative routines, to look for new solutions for technical and economic improvements, to come up with new procedures and arrangements, to combine technical knowledge with efficient project management, and to look for and to make use of government incentives and procurement projects.

Traditional universities and colleges are slowly getting indistin-

guishable from the for-profit sector. University "supermarkets" and "chains" are emerging with a concomitant loss of diversity. An important part of the academic process, the preparation of course content, is moving out of the traditional academic departments, into for-profit concerns. The danger of this transformation is that traditional institutions risk losing the independence of mind and action. Universities and colleges must remain the home of free and unfettered scholarship and teaching and the sponsors of objective debate on the controversial issues that society faces.

Pro-technology authors like Alvin M. Weinberg lean "towards the 'technological fix', i.e., development of technologies, that would accomplish the same ends as our existing technologies yet are so transparently safe that the public will, on reflection, accept them. This is the approach of the Inherently Safe Technology Movement." Pro-technology authors have drawn an analogy between the fear of witches in the fifteenth and sixteenth centuries and today's public fear of damage caused by low-level radiation from nuclear energy. They insist that improved nuclear energy may help to avoid the greenhouse effect.

how unregulated business practices may have a calamitous effect. I am referring to the sinking of the oil tanker the *Prestige* near the northern coast of Portugal. The *Prestige* was a vessel chartered by the Swiss-based subsidiary of a Russian conglomerate registered in the Bahamas, owned by a Greek through Liberia and given a certificate of sea-worthiness by the Americans. It is reported that every aspect of its operations was calculated to avoid tax, ownership obligations and regulatory scrutiny.

On 24 November 2002 Will Hutton commented in the *Observer* of London "This is the more visible aspect of the business dysfunctionality that globalisation helps foster -- and why those who argue the anti-globalisation movement is waning could hardly be more wrong." It appears governments are apologetic for globalisation and promising to civilise it.

On 21 December 2002 Nobel laureate Kenneth J. Arrow said in Dhaka that globalisation or market economy would have both positive and negative components. The policy makers should be aware of it so that the effect of the bad elements could be put aside and the

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Saharan Africa is lower now than twenty years ago. By contrast, countries that have managed the process of integration successfully, like South Korea, have integrated into the global economy on their own terms, reaping benefits in terms of both growth and poverty reduction."

Caroline Lucas MEP of Green Party in a letter written to the same issue of the *Economist* said, "There is overwhelming evidence that economic globalisation is responsible both for growing social inequalities and for unprecedented environmental damage... and governments are increasingly forced to compete with one another in a worldwide 'race to the bottom' on wages, taxes, and environmental protection and any other factor that might influence investment decisions."

We are at present far away from critical technologies like -- supercomputing, superconductivity, materials synthesis and processing and atomically engineered materials. These critical technologies require a special investment strategy to ensure stability, perseverance, and the attention of first-rate institutions that can provide a continuity of effort. Developing countries

may then be slowed down. Let poor countries like Bangladesh take to modest technology. A new type of cooking stove, a water-pump and waste-avoiding appliances may do immense benefit improving people's health, their quality of life and prospects for making a decent living from the land. For better energy management technology devices and global positioning system, radio and satellite technology, may be of great help. Unfortunately we have horrendous system losses in energy and water.

In the agricultural field there has of late been some mechanization. Still a large quantity of agricultural products is being wasted every year due to the absence of state-of-the-art agro-processing technology. The use of modern technology could usher in salutary changes in the processing of various types of food products. Raw materials then can be placed in various pressure levels in the extrusion technology. If less energy-consuming and cost-effective technology is introduced then production of human food and animal feed will be greatly changed to the benefit of the investors and consumers. The present-day world economy

could be nominated for the Nobel Peace Prize if they get it right at the Super Sport Park in Centurion on 1 March.

We all know who is going to win the America-Iraq match. That is a no-brainer. The World Cup is more difficult to predict. Australia is the George Bush of the Cup. India is giving every indication of being the Saddam Hussein: lots of support from people who cannot influence the result, immense posturing but no real hope... We cannot however rule out miracles. Both Saddam Hussein and Saurav Ganguly are currently praying for one.

Praying for a miracle



M.J. AKBAR

HAVE the Americans given sufficient thought to the calendar they propose for their war against Iraq? According to serious analysts, the date for the invasion is juggling between 15 and 21 February. Washington is expected to wait till the end of January for United Nations inspectors to deliver their full report (which, so far, has not discovered a smoking gun in Iraq, leave alone a smoking weapons of mass destruction). The White House will then spend a fortnight trying to get another, and hopefully unequivocal, resolution passed through the Security Council to serve as the international cloak before the dagger. Come 15 February, bang!

Does America realise that the dates clash directly with the Cricket World Cup in South Africa and Zimbabwe? The Americans could win the war on the ground and lose it in the air. Given a choice, what would you watch on television: cricket or war? President George Bush cannot be so isolationist as to be indifferent to the fact that the whole of the former British Empire, plus Holland, will be riveted to cricket rather than the second Gulf war.

It is obvious that Britain does not care, but that is no surprise. Britain has left its empire behind, physically, psychologically, emotionally,

even erased it from her memory. But surely America cannot be so irresponsible. After all, America has run the world, and do so, according to Texan optimists, for the rest of this century. That is a long haul. America could need the help of client states, as available from the old Empire.

It is true that China, Russia, Germany, France, Turkey and Japan will not be watching the Cricket World Cup, and will therefore concentrate their whole attention on America's techno-military prowess in the deserts, marshes

actually dared to invade America, did so with smashing success, and then fought a long war against the Americans. Who knows where it will sit when opportunity beckons?

So loyal, and useful, client states can only come from the English-speaking, cricket-playing world. Useful, because there is no point in having a client state that cannot look after itself: a superpower wants a comrade, not a leech. And how is the old Empire going to be impressed if we spend February and March rooting for Sachin

match play. Frankly, if you ask me, I don't think that either of them was in any serious trouble last month. They just wanted some rest from beating up England. Even for an Australian, smashing England into pulp can become boring. They wanted rest, in order to be fresh and fully fit for the World Cup. You notice this in Sachin as well. He has become a minimalist against New Zealand. They are all gearing up for the Real Thing. They also know that this will be their last World Cup. Sachin Tendulkar is 30, as are Rahul Dravid and Saurav

this match. And, of course, this match could lead to a resumption of Indo-Pak cricket on the subcontinent (if you can play in South Africa, why not here?), thereby ushering in a new era of peace, defusing the terrorist-induced crisis, changing the mood on Kashmir, persuading Islamabad to take firm steps towards the regime of SAPTA and SAFTA (agreed by all at Kathmandu in January 2002), and eventually eliminating the possibility of nuclear war between India and Pakistan. Saurav Ganguly and Waqar Younis

injure them through subterfuge. Alas, Pepsi Slezee won't work. Warner and Company may be greedy, but they are not stupid.

Will real sleaze work? It is estimated that some 80 per cent of the Cup money will be provided by the Indian advertiser. The Indian advertiser will not pay unless India plays. Ratings drop like a stone in a pond if India is not on the field. You can take a ten-second ad for Rs 10,000 when Australia plays South Africa, which is a proper game of cricket. Let India play Namibia and the same ad costs you Rs 100,000. You see how crucial it is to ensure that India get into the Super Six round?

So could the multinationals (it sometimes seems that the economic future of South Korea and Japan depends on the World Cup) spread the goodies to ensure that a few games are thrown? The idea has its merits. Cricket is money, not national pride. If money can work overground, it can also work underground. Corruption has already entered the game. It is also multi-racial. Remember Hansie Cronje? May his soul rest in peace since his last days were so tortured.

The problem is that administrators have now equipped themselves with hawk-eyes. Everything is monitored. They are even keeping tabs on bowlers who leave the field after finishing their ten overs so that a better fielder can replace them in the crucial last over. Unfortunately, even bribery and corruption must be ruled out.

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MJ Akbar is Chief Editor of the Asian Age.

BYLINE

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and mountains of Iraq. However, I hope the penny has dropped. All these nations are potential competitors of America, not allies, either singly or together, in the race to dominate the world in this century. Europe has already stated its claim to equality, and the euro is now valued above the dollar. The French already hate Americans (except as tourists). The Germans are more guarded and the Italians are checking out both sides. But France and Germany are determined to turn Europe into the superpower of the 21st century, and prevent the unchallenged sway of the dollar and the gunship. Russia has not given up its ambitions; it is only a matter of time before it begins to growl again, this time with more Tsarist cadence than Communist. China is well on its way to economic superstardom, backed by steely military muscle. As for Japan, who can really predict what it will do? It is the only race that

Tendulkar instead of General Tommy Franks? What would you rather watch on February 12? India vs Holland or America vs Iraq? Actually since India is playing Holland and I can't recall the name of a single Dutch cricketer, I might actually switch to the America-Iraq encounter. On the other hand, since India were turned into toast by New Zealand, one can never be sure of what India does against any team. Even this one could become a thriller, with India losing in the last over still two runs behind Holland's score of 167. You never know.

There is no doubt in my mind about the next match, though. On 15 February India plays Australia, and I am going to stick to this even if George Bush is celebrating victory with a mass in Baghdad Cathedral. Australia will already have beaten Pakistan by then. Glen McGrath and Shane Warne will have recovered from their injuries, and fired up by

Ganguly. The Australians are much older. The next World Cup will be in the West Indies, four years later. You cannot be fit for World Cup fielding at the age of 34 or more. Your body is past it. The Warnes and Tendulkars will squeeze every ounce of glory from this Cup. A lifetime of product endorsements depends upon it. Big Cricket is Big Money. The only person who will not retire by then will be Saurav Ganguly, because he will not go till he is pushed and no one will push him as long as Jagmohan Dalmiya is around, and Dalmiya is going to be around forever. So there.

Even a nuclear war would not drag me away from the India-Pakistan match on the first of March. This will be a hinge game. So much could hinge on it. For instance, who of the two teams would make it to the next round, the Super Six category. Who would be sacked by their Board for losing could depend on

could be nominated for the Nobel Peace Prize if they get it right at the Super Sport Park in Centurion on 1 March.

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There is of course what might be called the Pepsi Option. It is sleazy but it's there. It has been featured in Pepsi ads on television: you must have seen it, it always comes when something interesting is about to happen in the game. A clever Indian unplugs the Pepsi dispenser and Warner, Nasser Hussein, Jonty Rhodes *et al* injure themselves in frustration. You get the idea? If you can't defeat them fair and square,



All health information to keep you up to date

Asthma: Fighting for breath

Although the cause of Asthma is unknown, a number of factors have been identified which either increase the risk of, or are protective against asthma.

A family history of the condition, parental smoking, major respiratory infection and exposure to domestic allergens are recognised as risk factors. While breastfeeding for longer than six months, having more than four older siblings and living in village communities are known to be protective factors.

People with asthma have sensitive airways in their lungs. When they are exposed to certain triggers their airways get narrow making it hard for them to breathe.

These triggers can include colds and flu, exercise, inhaled allergens, cigarette smoke, changes in temperature and weather, certain drugs (e.g. aspirin), chemicals and strong smells.

The main symptoms of asthma are coughing, shortness of breath, tightness in the chest and wheezing. These symptoms may vary from person to person and from time to time.

Asthma cannot be cured but it can be controlled so that sufferers can carry out daily activities without symptoms. Controlling the condition involves:

- taking medications as directed;
- monitoring the condition;
- staying active and healthy;
- avoiding triggers wherever possible; and
- visiting a doctor regularly.

The best way of controlling asthma is by prescribed medications including inhalers (e.g. Becotide, Respocort), tablets and relievers (e.g. Bricanyl, Ventolin).

An asthma attack can take anything from a few minutes to a few days to develop. It can be fatal and asthma patients and their families must have an action plan in place should one occur.

Signs of a severe asthma attack include shortness of breath, rapid breathing, severe chest tightness, being unable to speak more than one or two words per breath and a blue colour around the lips.

Did you know?

In 460 BC, Hippocrates recognised spasmodic nature of Asthma?

Next: Around the world.