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EXPORT PERFORMANCE

Increasing Competitiveness through New Sources of Productivity Growth

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FOREWORD

It is increasingly being realised that not only export quantum but also its quality is crucial while strategising the external sector in the context of growth. Technology-base of a country's exports is important for several reasons. *First*, the global trade in technology and technology-intensive products and services is increasing at a much faster rate than trade in other sectors. *Second*, the greater is the technology-component of exports, the higher is the price realisation. *Third*, for most developing countries, the deficit in technology trade is very high. Exports of technology-intensive products based on imported technology may help reduce the trade deficits.

India which is rated to be the fourth largest economy in the world in the PPP terms, reportedly has the second largest engineering and scientific manpower. In the earlier phase of the development, India had followed a somewhat restrictive technology-import policy, simultaneously creating a large scientific establishment for indigenous capacity building. Since then, there has been a shift in policy allowing a freer import of technology. This is a right move because in the global technology market, the interface between import and export of technology is very strong.

This occasional paper looks at the technology-base of India's exports, benchmarked against the experience of several important countries of ESCAP region. The Study brings out the fact that across the countries studied, the share of technology-intensive products in total exports has gone up during the last half a decade. There are, however, miles to go. The Study has identified the policy measures that need to be taken to move along the path at a faster pace. In an earlier Occasional Paper No. 17 entitled "Export Product Diversification in the US Market: Indian Experience", it was shown that India has made an export breakthrough in technology-based products in the most sophisticated market of the world, e.g. USA. This Study reinforces that conclusion.

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NEW DELHI
June 2001

EXPORT PERFORMANCE
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SECTION I

RECENT GROWTH EXPERIENCE IN THE ASIAN REGION

SOME of the major economies of the Asian region had to face a severe economic crisis, triggered by a currency meltdown in mid-1997. Several policy measures were taken by the concerned national governments. The affected countries have started regaining part of the losses. In fact, the pace of recovery during 1999 was almost V-shaped and was much beyond expectations. GDP of the developing member countries of the Asian Development Bank (ADB) rose by 6.1 per cent in 1999 as against 3.3 per cent in 1998 and 6.0 per cent in 1997. According to the ADB, the recovery reflected the region's inherent strengths, the positive impact of the policy initiatives and a favourable external environment, which allowed a rapid expansion in the region's manufactured exports. The Bank correctly observed that whether the growth performance could be sustained would depend upon continuation of structural reforms, especially in the finance and the corporate sector and favourable external demand conditions for the region's manufactured exports, among others.[1]

Policies which helped the recovery process include the expansionary monetary and fiscal measures taken by the concerned Governments. The rapid expansion in intra-regional trade also gave a boost. The collapse of intra-regional trade was a major conduit of contagion and recovery was also transmitted by the same route.[2] However, the growth rate could not be sustained and fears were expressed that a new phase of slowdown might begin. Several factors could be identified which might cause the economic expansion to slow down. *First*, USA,

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* Presented at the Expert Group Meeting on Regional Economic Cooperation, Bangkok, 14-16 March 2001.

the principal export market for some of the major economies in Asia, is widely expected to record a lower rate of growth in 2001 which would also reflect on imports. *Secondly*, the electronics industry which has provided a major growth impetus to exports from the region may enter a phase where the growth will be lower. *Thirdly*, if there is an increase in oil prices, the oil import-dependent economies may also decelerate. *Fourthly*, the intra-regional trade which was the conduit for a rapid expansion in exports may again spread the contagion if a few large regional economies perceptibly slow down.

The forecasts made by some research bodies and the Governments do not so far signal any drastic reversal of the growth process. Institute of Developing Economies of JETRO released the forecasts for ten East Asian economies in December 2000. The countries are China, Hong Kong (SAR), Taiwan, Republic of Korea, Indonesia, Thailand, Malaysia, Philippines, Singapore and Vietnam. These countries as a group is estimated to record a growth rate of 7.8 per cent in 2000, which is 1.4 percentage points higher than that of 1999. The forecasted growth rate for 2001 for these countries is 6.8 per cent, one per cent lower than that of 2000. The growth is lower, because of the anticipated slowing of economic growth in USA and Europe and lower demand for IT-related products. There will, however, be substantial inter-country variations in growth expectations. The NIEs are expected to face significant deceleration in their exports which would bring down their GDP growth rates in 2001; 6.7 per cent for South Korea, 6.9 per cent for Singapore, 6.1 per cent for Taiwan and 4.7 per cent for Hong Kong. For ASEAN-5, the forecasted GDP growth rates are 4.7 per cent for Indonesia, 4.8 per cent for Thailand, 7.1 per cent for Malaysia, 3.5 per cent for Philippines and 7.2 per cent for Vietnam. The forecasted growth rate for China is 8 per cent.[3] However, there are forecasts which are more pessimistic. Consensus Economics of London has predicted that for the Northeast Asia, comprising China, Hong Kong, Taiwan and South Korea, the GDP growth rate will slump from an estimated 8.3 per cent in 2000 to 6.1 per cent in 2001. For South East Asia, the decline will be from 5.8 per cent to 4.4 per cent and for the Asia-Pacific as a whole, including Japan, from 3.7 per cent to 3 per cent this year.

Table 1 tabulates GDP growth rates, both actual and estimated, for 14 countries in the region. The broad pattern that emerges is that of a

mild slowdown than a steep fall. This picture may hold, if USA has a soft landing, EU has a higher rate of growth and the oil prices get stabilised at a reasonable level.

TABLE 1

REAL GDP GROWTH RATE. ACTUALS AND ESTIMATED, IN SELECT ESCAP COUNTRIES

Country	*Annual average (1989-1996)*	*1997*	*1998*	*1999*	*2000*	*2001.*	*2002*
Bangladesh	4.5	5.4	5.2	4.6	5.3	5.2	6.0
China. PR	9.7	8.8	7.8	7.1	8.0	7.8	8.1
India	5.5	5.0	6.8	5.9	6.4	6.1	6.6
Indonesia	8.1	4.7	(13.2)	0.2	4.5	4.0	4.3
Lao PDR	7.4	6.9	4.0	4.0	-	-	-
Malaysia	9.4	7.5	(7.5)	5.4	8.7	5.8	6.4
Myanmar	5.7	5.7	5.0	-	-	-	-
Pakistan	5.2	2.0	4.3	3.1	4.6	4.5	4.3
Philippines	3.3	5.2	(0.5)	3.2	3.9	2.9	3.7
Singapore	9.0	8.4	0.4	5.4	10.1	6.2	6.5
Sri Lanka	4.9	6.3	4.7	4.2	5.4	4.9	5.4
Korea Rep.	7.5	5.0	(6.7)	10.7	9.2	4.7	5.8
Thailand	9.0	(1.8)	(10.4)	4.0	4.4	3.9	4.4
Vietnam	6.9	8.2	5.8	4.8	5.8	5.3	5.9

Source: ADB, *Annual Report 1999; Far Eastern Economic Review,* 1 Feb. 2001.

The trade and current account balance of most of the countries in the region are either in surplus or manageable deficits. Some currencies are stable while a few such as India, Indonesia and South Korea had seen some depreciation (Table 2). These depreciations may help in pushing the export growth in these countries. India has, in fact, recorded an over 20 per cent growth rate during the first three quarters of the current fiscal year.

TABLE 2

CURRENT/TRADE BALANCE AND FOREIGN RESERVES

Country	*Latest 12 months ($ bn)*		*Foreign reserves* ($ bn)*	*Currency units (per $)*	
	Trade balance	*Current account*	*Latest*	*Jan 3rd*	*Year ago*
China	+26.3 Nov.	+15.7 1999	160.1 Sept.	8.28	8.28
India	-8.3 Oct.	-5.6 Q3	35.5 Nov.	46.7	43.5
Indonesia	+30.5 Oct.	+6.2 Q1	29.0 Nov.	9,550	7,195
Malaysia	+16.8 Nov.	+11.3 Q2	30.1 Oct.	3.80	3.80
Philippines	+5.8 Oct.	+9.1 Aug.	13.0 Sept.	51.0	40.2
Singapore	+4.0 Oct.	+21.6 Q3	77.8 Sept.	1.73	1.66
South Korea	+12.1 Dec.	+11.7 Nov.	92.6 Oct.	1,271	1,135
Taiwan	+7.4 Nov.	+7.5 Q3	109.1 Oct.	33.1	30.7
Thailand	+5.8 Nov.	+9.5 Nov.	31.6 Oct.	43.6	37.2

*Excluding gold, except Singapore, IMF definition.

Source: The Economist, 6 January 2001.

SECTION 2

THE EVOLVING COMPOSITION OF EXPORT TRADE IN ASIA

The export composition of some countries in the Asian region has been over the period changing in favour of manufactures. The low land/labour ratio, scarcity of other natural resources, complemented with a large skilled and unskilled labour, explain this movement. Some relevant data are in Table 3.

But even within the manufacturing sector, another distinct trend is visible. An increasing proportion of the region's exports is being accounted for by products which have a higher level of technology and science. An UN study has found that during the fifteen-year period between 1980-94, the proportion of labour intensive exports declined from 48.3 per cent to 33.3 per cent.[4]

TABLE 3

SHARE OF MANUFACTURES IN TOTAL EXPORTS

Country	*1990*	*1997*
SOUTH ASIA		
Bangladesh	77	87.5 [a]
India	72	74.0 [a]
Nepal	83	89.4
Pakistan	76	86.1
Sri Lanka	53	70.2 [b]
EAST ASIA		
China	73	86.7
Hong Kong	96	95.6
Indonesia	36	55.4
Korea	93	88.1
Malaysia	55	78.5
Philippines	68	87.6
Singapore	73	86.9 [c]
Taiwan	93	94.3 [a]
Thailand	61	73.3

Note: [a]1996, [b]1994, [c]1998.

Source: Drawn from Tables A4 and A5 of Major & Wood (2000).

Using the OECD classification, the study has made a detailed analysis of the export structure of the region (Table 4). Though there are large cross-country variances, the main conclusions are beyond doubt. *First*, the technology/science-based product categories, (comprising the scale, differentiated and science categories) have substantially increased their share in total exports. For Asia as a whole, the share rose from 42.5 per cent in 1980 to 59.7 per cent in 1994. *Secondly*, the rate of growth in exports has been the highest for the science-based category, though partly it was due to the low initial base. There is, therefore, a clear evidence of going up the value-chain in terms of export-product composition.

In the developing Asia, the countries which occupy the top positions as technology-based product exporters are Singapore, Malaysia, Taiwan and Republic of Korea. In all these countries as well as China and Thailand, foreign direct investment has played an important role, though there are large inter-country variations.

TABLE 4

TECHNOLOGICAL BASIS OF ASIAN MANUFACTURED EXPORTS

(Per cent)

Activity group	*1980*	*1985*	*1994*	*1985-94 (growth rate)*
		All Asia		
Resource-based	9.2	6.6	6.9	17.3
Labour-intensive	48.3	46.5	33.3	13.0
Scale-intensive	13.7	17.2	13.8	14.3
Differentiated	23.3	22.6	32.4	21.1
Science-based	5.5	7.0	13.5	24.7
		NIEs		
Resource-based	6.6	5.1	4.6	11.9
Labour-intensive	50.3	46.3	26.7	7.0
Scale-intensive	13.0	17.9	16.4	12.0
Differentiated	22.8	22.3	35.1	18.2
Science-based	6.3	8.4	17.3	21.5
		Non-NIEs		
Resource-based	23.0	13.4	10.3	23.0
Labour-intensive	40.5	49.3	43.0	24.5
Scale-intensive	12.7	14.7	10.5	22.1
Differentiated	22.1	20.8	27.6	29.8
Science-based	1.7	1.8	8.6	47.4

Source: UN, *Sharing Asia's Dynamism: Asian Direct Investment in the European Union*, 1996, p. 83.

Role of FDI in Promoting Exports

That FDI helps exports is seen from the experience of two star performers – China and Singapore.

China's total exports amounted to $30 bn in 1986, of which $29.5 bn was from domestic firms. At that time Foreign Investment Enterprises (FIEs, China's term for firms with FDI) exported just $0.5 bn, and the distribution of exports between these two types of firm was 98 to 2. But by 1997 exports were $182.7 bn, of which only $107.8 bn originated from domestic firms. There is further evidence of the close FDI-export relationship in the provinces.

The South East, Guangdong and Fujian received over $39 bn of FDI between 1983 and 1994, or 43 per cent of all FDI inflows into China. This region contributed 49 per cent of total exports in 1994. The Yangtse Delta got FDI of $19 bn during 1983-94; that was about 21 per cent of the total, and its share in total exports was 19 per cent in 1994. Corresponding figures for the Bohai Gulf region were 20 per cent for FDI and 17 per cent for total exports. FIEs contributed about one third of the total expansion in exports over 1992-96, according to some estimates.

Singapore is the other example of FDI supporting the national export effort. It has successfully transformed its export composition towards technology and knowledge-based industries. A substantial inflow of FDI has contributed to this flexibility in the production system. The average annual inflow of FDI into Singapore amounted to about $8 bn over 1995-98.

Exports are dominated by electronics products and components which account for more than 60 per cent of the total. The second most important industry is chemicals & chemical products with a share of 8 per cent. The third and the fourth ranking industries are petroleum products and machinery.

What is notable is that each of these four leading export industries have also been the recipients of the largest amount of FDI.

The share of foreign investment is extremely high in these leading export sectors, e.g. the share of foreign equity is 86 per cent in electronics and 87 per cent in chemicals. Also, it is very interesting to see that foreign subsidiaries have a much higher export orientation

than the domestic firms: in 1997, the exports-to-sales ratio of indigenous firms was just 27.5 per cent, but it was as high as 70 per cent for wholly owned foreign subsidiaries.

Change in India's Export Composition in the Post-Liberalisation Era

India's latest phase of economic reforms was initiated in mid-1991 with a primary focus on trade policy reforms.[5] The reform package included broadly the following:

- Removal of product specific export incentives coupled with a two-stage devaluation of Indian rupee;
- Use of exchange rate as the general instrument for export promotion and import management;
- Removal of quantitative restrictions on bulk of import items;
- Reduction in the level of tariffs on a large number of imports, including special provisions for preferential duty regime on imports for export production;
- Some minor administrative measures such as removal of minimum price restrictions on some exports; and
- Streamlining of the procedural regime designed to reduce transaction costs.

The underlying rationale of the policy initiatives lay in the appreciation of the fact that the earlier restrictive and basically inward-looking import substitution oriented policy regime created an inbuilt anti-export bias. These could be addressed by introducing competition, both through liberalising imports and changing the rigorous industrial licensing policy. The liberalised import policy can also positively influence the export sector, which would be able to access the international supply market for both capital goods and intermediates at a lower transaction and landed cost. The sustainable impact of trade liberalisation on export growth has been studied in the trade literature in a much more complex way, essentially through an integration of trade theory and growth theory. It suffices to observe here that the recent theoretical literature on the relationship between freer trade and higher growth has focused on the positive impact of trade on innovation through economies of

scale, technological spillovers and elimination of replication of R&D. Free trade provides access to a large international market, to state-of-the-art technology and to a larger stock of knowledge, which in turn leads to new product innovation. Empirical studies reveal that developing countries with limited R&D stock can boost productivity by trading with a more developed country having a large stock of knowledge from its cumulative R&D activity.

With the trade policy reforms, it can be hypothesised that distortions created through the earlier restrictive policy regime would get reduced. The operation of the free-market forces and removal of product specific incentives system should allow reallocation of resources according to the country's dynamic comparative advantage.

An exercise was carried out to find out whether reforms have in fact resulted in a change of the export composition. Specifically, whether there has been a movement in favour of technology and knowledge-intensive goods and away from primary resource-intensive products.

The major manufactured products have been segmented into three broad categories according to their technological characteristics, more or less based on the classification scheme of the OECD. There are three broad categories. *First,* resource-intensive products whose major competitive source is access to natural resources (e.g. aluminium smelting, oil refining). *Secondly*, labour-intensive products whose major competitive source is cost of unskilled and semi-skilled labour (e.g. garments, footwear, toys, etc). *Finally,* knowledge and technology-intensive products. This category consists of scale-intensive products whose major competitive source is length of production runs (e.g. steel, chemicals, automobiles, paper, etc.), differentiated products whose competitive source is customisation (e.g. machine tools, power generating equipment) and science-based products whose major competitive source is rapid application of science and technology (electronics, medicines, biotechnology, etc). The categorisation of the manufactured products has been done at HS 2-digit level.

Summary results of this classification exercise of manufactured exports of India from 1991-92 to 1997-98 are given in Table 5.

The share of technology and knowledge-intensive exports has increased from 18.50 per cent of total exports in 1991-92 to 23.70 per

TABLE 5

EXPORTS OF INDIA, 1991-92 TO 1997-98
(By category)

	1991-92	*1992-93*	*1993-94*	*1994-95*	*1995-96*	*1996-97*	*1997-98*
Resource-based							
Total (Rs mn)	166.304.9	206.159.6	285.394.3	306.397.7	484.149.7	557.902.6	647.141.7
Per cent of total exports	47.95	45.76	51.52	43.16	49.30	50.13	49.85
Labour-based							
Total (Rs mn)	110.464.4	143.281.7	171.319.3	217.023.1	263.589.9	271.864.3	320.615.6
Per cent of total exports	31.85	31.80	30.93	30.57	26.84	24.43	24.70
Technology-based							
Total (Rs mn)	64.163.52	93.031.94	140.301.2	173.684.9	223.456.3	269.520.5	307.734.1
Per cent of total exports	18.50	20.65	25.33	24.46	22.75	24.22	23.70
Total exports (Rs mn)	**346,850.3**	**450,527.1**	**553,966.8**	**709,953.3**	**982,095.1**	**1,112,966.9**	**1,298,227.4**

Source: CMIE. India Trades Database: and DGCI&S.

cent of total exports in 1997-98. The share of labour-intensive exports to total exports had gone down to 24.70 per cent in 1997-98 from 31.85 per cent in 1991-92. However, the share of resource-intensive exports to total exports did not show any definite trend over the years.

The conclusion is, therefore, that during the post-1991 period, India's exports of manufactures have shifted towards more value-added product categories. Their gain has primarily come at the cost of labour-intensive products. Resource-intensive export products have not shown any definite trend over the period.

It has been found empirically that in global market, demand for knowledge-intensive or capital-intensive product groups is increasing at a faster rate than that of labour-intensive products. To test whether India's experience is in line with the global trend, log linear trend equations have been estimated from 1991-92 to 1997-98.

The growth rate of technology and knowledge-intensive exports was the highest. The trend growth rate of resource-based, labour-based and technology and knowledge-based manufactured exports were 25 per cent, 17 per cent and 26 per cent respectively. The Indian experience is, thus, consistent with the global trend.

SECTION 3

INDIA'S EXPORT PRODUCTIVITY GROWTH THROUGH ICT AND OTHER SUPPORT SERVICES

Liberalisation in Export-Support Services

Among the service providers, the three most important ones which can substantially impact the competitiveness of the export sector, are telecommunications, the commercial banking system and transportation. All these sectors were strictly regulated in India with strong government monopolies. The process of liberalisation started in the 1990s.

Telecommunications, including internet, provide the backbone of international commerce. The quality and quantity of access as well as the costs are critical components of international competitiveness. In terms of access availability, after the deregulation, the waiting period

has substantially come down and is currently estimated to be less than a year. The cost of access, both for national and international calls, has also come down. In terms of policy measures, the Government had opened up domestic long distance services, international gateways and connection to submarine cables. The only remaining government monopoly is in international voice services. This was to continue up to March 2004 which now has been advanced to April 2002. The policy also provided considerable reduction in terms of applicable customs duties. The basic customs duty was brought down in 2000 from 25 to 5 per cent on several items, including cellular mobile handsets, ATM switches, frame relay switches, routers and radio pagers FDI policy on the telecommunication sector has also been reviewed for further liberalisation. However, though for the time being, the Government has decided not to allow FDI up to 100 per cent from the currently applicable cap of 49 per cent, some relaxation has recently been announced. Foreign equity up to 100 per cent is now allowed in B2B e-commerce, subject to the condition that the foreign investor will divest 26 per cent of the equity to the public within five years, if it is already listed abroad.

One of the basic objectives of the policy reforms in general had been to attract FDI. The FDI flows to the telecommunications sector have been fairly good, though not spectacular. From 1991 to 2000, the total FDI flows to this sector amounted to Rs 44.97 billion or about US$1 billion. The distribution of FDI has been as indicated in Table 6.

TABLE 6

FDI FLOWS TO TELECOM SECTOR

Sector	*Rs million*	*Per cent share*
Cellular services	21,871	48.7
Manufacturing & consultancy	7,500	16.7
Basic services	3,316	7.3
Cable & internet	599	1.3
Others	11,683	26.0

Source: Tele.net, January 2001.

Most of the investment amounting to Rs 28.6 billion has been routed through Mauritius, due to bilateral tax treaty. USA occupies the second slot with Rs 3.7 billion. Among Asian countries, Thailand and Singapore are prominent investors.

India's position in the telecom sector, benchmarked against some other countries in the Asia-Pacific region, can be seen from the Appendix Tables A1 & A2. It is evident that despite all the policy improvements, there is enormous scope for further upgradation and upscaling of the telecom infrastructure. India's ability to develop this will be critical for the growth of both domestic and external trade.

The other service sector which has an important bearing on export-sector efficiency is the commercial banking system. Since all export-import documents are to be processed by the banks which have to provide export-import credits, offer forex-risk-management services and ensure receipt of export-receivables in many cases, their role is significant. The banking sector reforms have just started in India. Major initiatives so far taken include deregulation of interest rates and allowing entry of the private sector banks. Private sector banks have gone for more automation and value-added services. Public sector banks have also started investing in computerisation and some of the banks have made considerable progress in this regard.

In terms of productive efficiency, complaints mostly refer to delays in getting work done in the banks. A recent study by the Export-Import Bank of India[6] has found that of 111 firms interviewed, 40 confirmed having problems with banks. Of the six software firms contacted, all had faced problems in dealings with banks. The major problem identified by the study is the extra time taken by the banks (extra time defined as the difference between the stipulated time and the actual time). For example, in the case of engineering good exports, the stipulated numbers of days were five. Additional time taken was ten days. The Reserve Bank of India in its survey[7] has found that after private banks were allowed to operate and foreign banks were permitted to open more branches, the spreads in the banking sector has come down. Further, the wage bill as a percentage of the total assets has declined from 2.05 per cent in 1995-96 to 1.66 per cent in 1999-2000. According to RBI, most of the efficiency enhancements have been due to the financial sector reforms. However, it is of the

view that substantial improvements will have to take place to ensure that financial institutions are in a position to manage their risks better.

The third important service sector is the surface transport sector, especially of ports. Timely and cost-effective delivery system is at the heart of international competitiveness. Bulk of India's exports is shipped by marine transportation mode and, therefore, the efficiency of the port system affects the international competitiveness and delivery competence of India's export sector. The existing infrastructure is insufficient to handle trade flows efficiently. As against a total capacity of 240 million tonnes on March 1999, major ports handled 251.7 million tonnes, resulting in pre-berthing delays and longer turn-around time. A Government of India Report[8] observed that Indian ports have a lower level of productivity in comparison to efficient ports in the Asian region in terms of labour and equipment productivity norms. However, some improvements have been recorded recently. The principal indicators of port-efficiency, viz. pre-berthing detention, average turn-around time and output per ship-per berth-per day at major ports, have all improved in 1999 over 1998. The average pre-berthing detention and the average turn-around time have come down from 2.4 days and 6.6 days in 1997-98 to 2.1 days and 5.9 days in 1998-99 respectively. The output per berth-per day also increased from 4,634 tonnes in 1997-98 to 4,915 tonnes in 1998-99.

However, these improvements could be sustained only if the port infrastructure is up-scaled and this will require major investments. In view of the resource-scarcity to undertake massive investments in increasing port capacity, the Government of India has introduced a policy of allowing private investments.

The guidelines for forming joint ventures in major ports were issued in June 1998.[9] These provide for formation of joint ventures between a major port and a foreign major port, a major port and a minor port and a major port and a company/consortium on BOT basis. Bilateral arrangements with foreign governments are also allowed for import of technology, managerial practices, etc.

The Government has also laid down guidelines for private sector participation in the port sector in the following areas:

— Leasing assets of the port

— Construction and operation of container terminals, multi-purpose cargo berths and special cargo berths, warehousing, storage facilities, tank farms, container freight stations, setting up of captive power plants, etc.

— Leasing of equipment for cargo handling and leasing of floating rafts from the private sector

— Pilotage

— Captive facilities for port based services.

During the Nineth Plan period (1997-2002), the resource gap is estimated to be Rs 80,000 million which is to be bridged by private sector participation. So far, the Government of India has approved private investment of Rs 36,760 million which will create additional 48.5 million tonne capacity.[10]

IT Sector in India and its Impact on Export Sector Productivity

India's emergence as a major player in information technology industry, specifically in the software sector, has been recent. But its growth has been spectacular. During 1994-99, Indian IT industry has recorded a compound annual growth rate of more than 50 per cent which is almost double of the rate of growth in some developed countries. Software constitutes the principal component, accounting for about 65 per cent of the total industry revenue. Some relevant data on Indian IT industry are given in Table 7.

TABLE 7

IT INDUSTRY IN INDIA

	March 2000	*March 2008*
IT industry revenue	$ 8.6 billion	$ 140 billion
Software industry revenue	$ 5.7 billion	$ 87 billion
Software exports	$ 3.9 billion	$ 50 billion
Total No. of PCs	4.3 million	20 million
Internet subscribers	0.77 million	35 million
Internet users	3.2 million	100 million

Source: NASSCOM.

Currently, IT spending as a percentage of GDP is less than one per cent as against more than 8 per cent in USA. However, with the Government's plan to raise IT spendings, the percentage is expected to go up to 2.5 per cent in 2003. In most countries, governments are the driving force behind IT investment. India is no exception; Government accounting for about 30 per cent of aggregate IT expenditures. The major sectors where IT adoption rate is high are central and state administration, insurance, banking, financial institutions, ports, customs and large corporate sector. The geographical spread of IT has been rather uneven so far. States such as AP, Maharashtra, Karnataka and Tamilnadu have progressed fast. Some other states have/are preparing plans for large-scale induction of IT in governance as well as education.

Software has been the major source of IT boom in India. Apart from the large scale availability of skilled manpower, other contributory factors include widespread command over English, convenient time zone and a fairly good and cheap telecommunication service.[11] Exports had so far recorded a spectacular growth from Rs 10,200 million in 1993-94 to Rs 172,000 million in 1999-2000. Apart from the monetary growth, the diversity of products/services offered has also increased substantially. It is significant that R&D spending by Indian software firms accounted for 3.2 per cent of their total revenue in 1998-99.[12] This is a pointer to the industry's investment in creating IPR and developing practices and domain knowledge for moving up the value-chain.

The software industry has developed, practically independent of regulatory and restrictive practices. The Government has somewhat belatedly realised the enormous potential of the industry and has introduced some promotional measures. The most important measure is the Software Technology Park (STP) Scheme.[13]

STP scheme is an 100 per cent export oriented scheme for the development and export of computer software using data communication links or in the form of physical media including export of professional services. STP can be a virtual software development unit or can be an infrastructural complex, providing support to several STP units. The principal features of the STP scheme are given below:

- Approvals are given under single window clearance mechanism.
- Projects costing up to Rs 100 million with Indian investment and NRI (non-resident Indians) funds on non-repatriable basis are cleared by local STP authorities at centre level itself.
- 100 per cent foreign equity is permitted.
- All the imports in the STP units are completely duty free.
- Import of goods on loan, free of cost and lease basis is permitted.
- Re-export of capital goods brought on loan/lease/free of cost is permitted.
- Domestic purchases are completely excise duty free.
- Domestic purchases are eligible for the benefit of deemed exports to the suppliers.
- The sales in the Domestic Tariff Area (DTA) are permissible up to 50 per cent of the export in value terms.
- STP units are exempted from corporate income tax till the year 2010.

The IT manufacturing sector is also growing at a satisfactory rate. Its average growth rate has been around 30 per cent during the last decade. The industry has more than 135 hardware manufacturers, supported by over 800 ancillary units. As in the case of software, the Government of India has formulated a scheme entitled Electronics Hardware Technology Park (EHTP). The electronic industry in India grew in a protected environment. It is now necessary to open up to international competition if the industry has to flourish in a globalised environment. The EHTP scheme provides an enabling policy environment for the same.

The impact of IT industry growth on economic performance has been analysed in great detail in USA but there is no consensus on its true impact. In a testimony to the Congress, Chairman, Federal Reserve Board, Alan Greenspan has said:

> "Our nation has been experiencing a higher growth rate of productivity – output per hour worked – in recent years. The dramatic improvements in computing power and communication

and information technology appear to have been a major force behind this beneficial trend."

In 1996, IT industries accounted for an estimated 7.5 per cent share of the economy and an estimated 15.8 per cent of the rise in the GDP in current dollar terms. By 1997, IT industries accounted for an estimated 7.8 per cent of GDP and 12.4 per cent of its nominal growth, while in 1998, these figures rose to 8.2 per cent and 14.7 per cent respectively.[14]

Another study showed that manufacturing industries where computer and related capital exceeded four per cent of the capital stock, enjoyed a productivity advantage of two to three times greater than non-users and the advantage was widening over time.[15] This study also showed that no such advantage could be ascertained in the service sector which in fact accounted for 75 per cent of computer spending. This surprising result was possibly due to the difficulties in measuring productivity in the service sector.

According to another school of thought, other factors may account for recent good performance and the data do not unambiguously confirm that the large scale investment in the IT sector had a strong beneficial impact on the rest of the economy, because the time lag between investments made and their final impact is generally long.

In India, the investment in the IT sector as a percentage of GDP is still very low, despite its recent growth and, therefore, in quantitative terms, the impact so far cannot be too high. This is also because the growth has been mostly on the software side and the boom is essentially export-driven.

However, IT has no doubt started contributing to increased competitiveness of India's exports. Part of it has been coming from the increased efficiency and the tariff structure of the service providers, such as telecom and banks. But part of it has its origin in-house. Some of the export-manufacturing firms have started using IT enabled mechanism for design and fabrication. Use of computer for on-line development of designs in garments and footwear industry is increasing. This is drastically reducing the product-development cycle time and has also reduced associated costs.

One major instrument of market entry as well as seeking business opportunities abroad has been the internet in the last few years. An increasing number of export firms, including many in the SME sector, have started developing their presence in the Net.

Indian export firms have also started taking advantage of international on-line trade inquiries. The Trade Efficiency Initiative of UNCTAD has, as a key element, the Trade Point Programme. In its international dimension, a Trade Point is a contact point in a worldwide network and serves as a gateway to the global market. Trade Points are expected to improve trade efficiency by

(i) helping traders to find new export opportunities,

(ii) attracting new traders and offering access to new opportunities in external trade, and

(iii) lowering the cost of export and import transactions.

National Centre for Trade Information (NCTI) was set up by the Ministry of Commerce as a joint venture of India Trade Promotion Organisation and National Informatics Centre. The objective of NCTI is to collect and disseminate trade data to the trade & industry, especially the SMEs. The Trade Efficiency Programme of UNCTAD has certified NCTI as an operational Trade Point in Delhi. It uploads the trade leads on the GTP Net as per UN/EDI FACT standard and downloads the trade offers received through the GTP Net and disseminates the same, through both electronic and print mode.

Another important mechanism in the same genre is the WTC network system which is operated by the World Trade Centres Association in more than 75 centres. In India, the system is operated through the World Trade Centre, Mumbai. Although it is an integrated system, NETWORK functions as three distinct products – an electronic trade lead system with worldwide reach, known as the Bulletin Board, an electronic messaging system also worldwide, and a database which enables subscribers to access diverse business information.

Apart from such international on-line information network, Indian industry has also taken initiative in creating their own electronic information networks for international trade. FICCI, one of the national level Chamber of Commerce in India, has set up BISNET which is a computerised on-line business information service with extensive

network linkages in the region, such as Confederation of Asia-Pacific Chambers of Commerce and Industry (CACCI network), South Investment, Trade and Technology Data Exchange Centre (SITTDEC), GLOBELINK of Singapore Trade Development Board and PUSDATA of Indonesia.

Knowledge Economy and Enhancing Export Competitiveness Through Human Capital

Gradual integration of the Indian economy with the rest of the world through the removal of market access barriers with consequent rise in exports and imports will have a substantial impact on the demand for education in India. The increased demand will originate in the shift towards higher production in the skill-intensive sectors, but mainly by increasing the demand for more educated workers within each sector, because of the wider diffusion of modern products and methods of production. One study[16] found that under some assumptions, over the next decade or two, the demand for illiterate worker (mainly because of shift away from agriculture) may fall by 20 per cent. Within the literate workers, the increase in demand would be higher in line with the level of education—from about 12 per cent for primary school graduates to about 60 per cent for college graduates.

India's recent success in IT sector and relative success in transforming the export sector towards the skill/knowledge-based products is certainly attributable to its fairly well-developed infrastructure at college level, both in general and technical education. The importance of human capital in pushing up economic growth has been emphasised for quite some time in economic literature. Recently, this argument has been extended which incorporates the impact of trade expansion. Robert Lucas,[17] in an analysis of the growth experience of the East Asia has concluded:

> The main engine of growth is the accumulation of human capital — of knowledge—and the main source of differences in living standards among nations is differences in human capital. Physical capital accumulation plays an essential but decidedly subsidiary role. Human capital accumulation takes place in schools, in research organisations, and in the course of producing goods and engaging in trade. Little is known about the relative importance of these different modes of accumulation, but for understanding periods of very rapid

growth in a single economy, learning on the job seems to be by far the most central. For such learning to occur on a sustained basis, it is necessary that workers and managers continue to take on tasks that are new to them, to continue to move up what Grossman and Helpman call the "quality ladder". For this to be done on a large scale, the economy must be a large scale exporter.

Export diversification involving new technology-based products allows a country not to get locked in the traditional skills categories. While an open external market is a must, the supply side scenario will depend upon the country's education/ training policies. In several East Asian countries, public policy has been instrumental in the diffusion of technical skills in the labour force. The Governments in Indonesia, South Korea and Taiwan consciously attempted to alter the academic-vocational ratio in secondary schools towards more vocational enrolments by building a larger number of vocational and technical schools and by introducing vocational studies in academic curricula at high schools.[18] It was also found that the number of students in vocational education in India is substantially lower compared to the level in East Asian countries. This reveals the fact that a large proportion of the manufacturing workforce in India lacks skills required for industrial competitiveness. As a determinant of export competitiveness, high level technical skills, rather than general level of education, is more critical. In entire Asia, there is a distinct bias in favour of engineering rather than science. The ratio of engineers to scientists is high in most of these countries. This emphasis contributes to their industrial efficiency and export dynamism.[19]

Though proportionately speaking, India does not score very well, in absolute terms India's educational infrastructure is quite impressive. It has one of the world's largest technical workforce, estimated at more than four million engineers, scientists and technicians. There are 325 national laboratories and publicly-funded R&D institutions as well as about 1,250 industry-based R&D centres. There are 200 universities with 7,500 affiliated colleges, 300 engineering and technology colleges, over 1,000 polytechnics and IITs.

But even with this infrastructure, the supply for education and skills will increasingly fall short of demand. The area of IT itself can be cited as an example. The NASSCOM-McKinsey Report has projected

export of software, and IT enabled services to the order of $50 billion and domestic demand of $37 billion by 2008. To achieve these targets, India would need an estimated IT manpower of about 2.2 million including 1.1 million high level professionals at the level of B.Tech/ MCA or above and the remaining 1.1 million at lower level, coming mainly from Science and Humanities streams with some training in IT. Currently, about 340,000 IT professionals are employed in India. Thus, there will be an additional requirement of 760,000 high level IT professionals over a period of eight years. However, for various reasons like inadequate infrastructure, lack of good faculty, though the intake at the B.Tech/MCA level is around 75,000, only about 25,000 are of high standards. So, there will be an enormous shortfall in the supply of IT professionals in India.[20] This will get more adverse, as many, including some of the brightest, will opt for overseas assignments, as several countries, such as USA and Germany, have opened up their doors.

Several strategies are being implemented/conceptualised to raise the technical manpower, both qualitatively and quantitatively. To upgrade the quality of teaching, at the B.Tech/MCA level, the Ministry of Information Technology had implemented successfully the project IMPACT, which was supported by the World Bank, Swiss Development Corporation and Government of India during 1991-97. The Project aimed at upgrading the quality of education in select institutions including 14 engineering colleges and 12 polytechnics.

To consolidate the gains of the IMPACT project which was done on a pilot basis, Sustainability Support Scheme was launched in 1997, covering the same institutions to make them progressively self-supporting through internal revenue generation from activities like Continuing Engineering Education Programme (CEEP), consulting, etc. The Programme also includes obtaining ISO 9000 certification for IT streams of these institutions together with TQM.

The basic tasks before the Government are the following:

First, how to provide universal and cost-effective primary level education to all. This is critical because in a liberalised environment, the unskilled labour will suffer most.

Secondly, how to introduce a strong vocational component in the secondary education curricula.

Thirdly, how to ensure quality standards in the tertiary sector, especially in the engineering/polytechnics, etc.

Fourthly, how to get higher private sector participation in creating bigger and better educational/training infrastructure.

Indian software firms as well as some others in areas of manufacturing and services have realised the importance of ensuring a progressively higher level of skilled/trained manpower for their continued survival and growth. They have started contributing to various technical institutions. Some have also directly entered the education sector as a business proposition.

Fifthly, the programme for technical education has to consciously integrate the agricultural sector. The land/labour ratio in many Asian countries, especially India is not favourable, and, therefore, the need for increased productivity is still more paramount.

Several recent studies have demonstrated the importance of knowledge, in enhancing productivity in traditional production sector, e.g. agriculture. Farmers can learn by doing and/or from others with respect to new technologies and their adoption. A micro-level study[21] on Indian agriculture found that imperfect knowledge on how to use new varieties of high-yielding varieties of rice and wheat was a significant barrier to their adoption. There is also evidence of learning spillover. Farmers with experienced neighbours are significantly more profitable than those with inexperienced neighbours and the former is likely to devote more of their land to new technologies.

Agricultural extension services, centres of agricultural research and training and demonstration centres need to be supported by the State, since sustained exports from the agriculture can be expected only if there is both higher productivity and value-addition. Both these would need substantial knowledge and technology inputs.

SECTION 4

POLICY MEASURES FOR SUSTAINED EXPORT DEVELOPMENT WITH SPECIAL FOCUS ON TECHNOLOGY/SKILL-INTENSIVE PRODUCTS

Given the low growth rate in global demand for commodities and low skill/low technology intensive products as well as the continued stagnation in their price realisation, it is imperative that governments initiate specific measures to promote high value-added products. Value-addition can come only through introduction of technology at each stage of the value-chain and is not limited to only manufactures but is equally critical for agricultural products. Further, even exclusive of the value-addition need, technology induction is becoming increasingly critical for conforming to the SPS standards of major developed importing countries. For example, spices are an important export item for several Asian countries. Chemicals and organic residuals in spices result in non-conformance of SPS requirements. Cleaning process which can take care of the impurities is in fact available but is highly technology intensive, such as steam sterilisation and super critical Co2. Energy efficient technologies in tea manufacturing can lead to substantive cost reduction and increased profitability.

The policy issues to be addressed are related to the measures which a government can introduce to speed up the capital-deepening process, especially in the export-manufacturing. Some measures which are already being implemented or can be introduced are:

1. Liberal Technology Import Policy

Most countries which are currently large technology-based product exporters have been following a liberal technology import regime. Balance in technology trade is even now negative for many OECD countries. The first step to access global technology market is to have a liberal technology import policy. Some countries which have plans in this sector have already started taking policy initiatives. Since reforms and gradual opening to the outside world, China has expanded its technology imports in the priority sectors, such as energy, transportation, telecommunications, as well as some hi-tech areas, namely switchboards, micro-electronics, aircraft manufacturing, space technology, etc. During 1978-98, China signed 27,825 contracts for

technology imports amounting to US$105 billion. In 1998 itself, 6,254 contracts valued at US$16 billion were signed.[22] China has recognised that the foundation of its technology exports will have to be on the foundation of technology imports. For example, one of the high growth sectors in China's exports is the household electrical appliances. The major Chinese firm in this field is the Haier group which has extensive export operations in Asia, Africa, Europe and North America. Haier group originally imported refrigerator-manufacturing technology from Germany in 1984. China began exporting technology in 1980 and since then it has progressed fast. In 1998, China signed 2,500 contracts for technology exports for US$6.7 billion.

China's Ministry of Foreign Trade and Economic Cooperation (MOFTEC) has unveiled a strategy in 1999 to promote the technology-base of Chinese exports and expand the export growth, in association with the Ministry of Industry and Ministry of Science and Technology (MOST). Major elements of the strategy include:[23]

- Developing hi-tech products for export and upgrading the technological level of traditional export commodities. MOFTEC and MOST are taking active measures to encourage related research institutes and enterprises to accelerate research and development of hi-tech products. A special effort will be made to increase the percentage of high value added and new technological products to optimise the composition of export commodities.

- Currently, sectors like information, biomedicine, new materials, consumer electronic products and household electrical appliances have been selected as priority industries to develop.

- Foreign trade departments will give support to hi-tech enterprises in holding exhibitions abroad, training foreign trade personnel and doing marketing abroad. Examination and approval formalities will be simplified to quicken the pace of granting import and export power to scientific academies, research institutes and hi-tech enterprises. Since research and development of hi-tech export products require heavy investment and have high risk, the state encourages the enterprises to absorb foreign capital and raise funds from the international financial market. At present, 15 cities, including Beijing, Tianging and Shanghai have been chosen to experiment. It is aimed

to promote these cities' export of hi-tech products by formulating supportive policies, thus setting examples for the whole country.

- Offering information services for export promotion of hi-tech products. The MOFTEC will strengthen contacts with the MOST and other related industrial departments to offer timely and latest international market information on hi-tech products and technologies to various sectors.
- Up till now, 53 national hi-tech industrial parks have been established in the country. Learning from the experiences of USA, Singapore and Taiwan in running hi-tech parks, the foreign trade departments will provide preferential treatments to these national hi-tech parks and encourage them to enter the international market and promote export of hi-tech products.

The Government of India has also taken steps to liberalise the technology import policy. So far, import policy had put several restrictions on the amount that could be paid as a lump-sum payment, royalty ceilings on domestic and export sales as well as the modality of instalment payments. The new technology import policy announced in 1998 had removed all these restrictions, for projects assessed and funded by financial institutions as well as projects for central and state public sector enterprises. The new policy recognises that import of technology is basically an investment for eventual export of technology based goods and services.[24]

A liberal technology import policy allows domestic firms to enter into technical joint ventures (without equity participation) with foreign partners or go for outright purchase of technology. Either way, it facilitates access to the global technology market at market-determined prices.

2. Liberal FDI Policy

The technology import policy needs to be complemented by a liberal FDI policy. Domestic firms in many Asian countries are short of financial resources to purchase technology. They are also not always equipped to absorb the imported technology. Further, in some cases, technology-holders may not like to part with their technologies except in equity-linked joint ventures. Sometimes, they may like to come only by setting wholly-owned subsidiaries.

A liberal FDI policy is, therefore, required if a country seeks to strengthen its technological base. In several countries in Asia such as China and Singapore, FDI has played a significant role in promoting exports in general, and value-added exports in particular. Many studies show that long-term political stability and the ease of doing business have been more important considerations in location-making decision of FDI than fiscal concessions.

3. IPR Regime

Access to state-of-the-art technology is quite often hampered if the technology-holders are not satisfied with the IPR protection normally sought by them. It will, therefore, be necessary to review the domestic legislation and provide the protection normally sought by the technology-holders.

4. Labour-market Reforms

The labour market rigidities which are primarily the result of governmental policies directed ostensibly to protect the interests of labour prevent a rapid expansion of firms which will like to modernise or enter into new and more profitable sectors. Since there is no exit policy, new firms fear to enter and older firms to expand where the production is labour-intensive and is, therefore, consistent with the classical comparative advantage theory. As going up the value-chain will inevitably involve greater automation, redefining of job responsibilities and skills upgradation, the existing labour laws will require to be redrafted for allowing such flexibilities.

5. Promoting Local R&D

While import of technology and accessing the same through the FDI route should be promoted, it does not mean that a country need not commit some resources to local R&D efforts. A minimum level of these activities are required even for optimal utilisation of foreign technologies.[25] Expenditure on R&D is very low in most countries in the Asia-Pacific. During 1985-95, the average R&D expenditure as a percentage of GDP was 0.8 per cent for India, 0.5 per cent for China, 0.4 per cent for Malaysia, 0.2 per cent for Philippines and 0.1 per cent for Thailand.[26] These expenditures need to be upgraded. In most developing countries, bulk of R&D expenditures are committed by the governments and supported institutions. To promote R&D

activity by the private sector, policy instruments such as weighted deductions under income tax provisions can be thought of.

6. Creating Institutional Mechanism for State Supported Services

Promoting exports which have a higher level of skill and technology content will need focussed support from the Government. Exporting firms will have to be supported by providing information and intelligence on techno-commercial aspects, IPR, legal systems, etc. This will help the firms concentrate on their core business activity of manufacturing. It is essential that an institutional mechanism is created to provide the support services to such technology-based product exporters. Further, the "made-in" factor which is currently negative for most developing countries needs to be countered and this can be done effectively only at a national level. The Department of Science and Technology, Government of India and Confederation of Indian Industry, a leading industry association, have jointly set up a Technology Export Development Organisation (TEDO).[27] The primary objective of TEDO is to promote and support technology exporters through collaborative efforts of the Government, industry, research and other academic institutions, financial institutions and other export promotion agencies. Its major activities will include (i) technology export information services, (ii) training, (iii) trade fairs and technology demonstrations, and (iv) technology related joint ventures abroad.

7. Raising Productivity of Support Services

It will be desirable to ensure that the important service providers are made competitive, if necessary, by liberalising entry conditions. Further, public as well as private investments are to be encouraged for capacity augmentation, and automation for achieving high level of efficiency.

8. Developing Human Resource

(i) Since capital deepening is taking place endogenously, a process which needs to be accelerated through policy interventions across the product matrix, the skill-level of labour will also require a simultaneous upgradation. This will essentially imply a reduction in demand for unskilled labour and a rise in demand for semi-skilled and skilled labour. If the demand cannot be met, there will be both

an increase in labour cost (in excess of what is attributable to incremental skill level) resulting in loss of competitiveness and a sub-optimal growth in exports. For many producing sectors, such as agriculture, including plantations and floriculture, leather and manufactures, etc, the demand will be more for semi-skilled labour who has some years of schooling and is not necessarily a certificate/ diploma-holder from a technical institute. The Government has, therefore, to ensure that primary and secondary level education is available and economically accessible to all. The high drop out rate currently seen in some countries including India reflects both the economic inability on the part of the parents as well as the market demand for unskilled labour. When the market demand shifts in favour of semi-skilled labour, the drop out rate is expected to decline. Governments should also enlist support of local NGOs which are active in this sphere of activity.

(ii) While private sector participation will be minimal at primary/ secondary level, its involvement can be substantial at the tertiary level. Technical schools and colleges can be promoted by the private sector within the policy framework enumerated by the Government in terms of curricula, and evaluation norms. The fee structure will get determined through market competition and, therefore, will not require state intervention.

(iii) Going up the value-chain and introduction of new technology-based products will also require the support of professionally trained management and marketing professionals. This will inevitably need creating greater institutional capability, both in terms of intake and quality.

(iv) While capacity-building to provide education/training facilities required for export expansion must be a priority, in the short term, liberal allocation of foreign exchange for those who would like to study abroad can help in the short run. For example, during the last two decades, 320,000 Chinese students were sent to 103 countries to study. Of these, 50,000 were sent by the Ministry of Education, 100,000 by respective organisations and the rest went on their own.[28]

APPENDIX

TABLE A1

INTERNET IN THE ASIA-PACIFIC REGION

Economy	*No. of ISPs 1999*	*Users June 2000*		*Dial-up internet access*
		('000)	*Penetration(%)*	*Total charge($)**
Australia	760	6,400	33.80	32.39
Bangladesh	26	100	0.08	46.47
China	250	16,900	1.33	117.14
Hong Kong SAR	159	2,250	32.70	15.22
India	138	3,700	0.37	24.02
Indonesia	35	1,000	0.48	23.45
Iran	4	100	0.15	36.66
Japan	4,011	26,000	20.60	81.21
Korea (Rep.)	31	15,750	33.90	33.32
Malaysia	7	2,500	11.45	12.37
Nepal	11	40	0.17	25.17
New Zealand	40	1,200	31.30	12.99
Pakistan	50	500	0.37	30.13
Philippines	160	600	0.81	26.20
Singapore	3	1,758	45.10	11.12
Sri Lanka	20	70	0.38	25.24
Taiwan-China	84	6,400	28.90	74.29
Thailand	14	1,000	1.64	13.21
Vietnam	5	150	0.19	42.21
Asia-Pacific Total	**5,836**	**86,572**	**2.50**	**52.68**

*ISP charges + local telephone charges.

Source: ITU.

9. Bridging Digital Divide

Access to computer and internet will increasingly influence a country's competitive strength. Digital divide which is very evident now will have to be addressed. Programmes of the nature of Global Compact as proposed by the United Nations need to be upscaled and be made an integral component of technical cooperation.

10. Technical Cooperation Among Developing Countries

A number of countries in the Asia-Pacific region has a developed academic infrastructure in scientific, technical and business management areas. Some governments have also programmes which provide funds, though on a limited scale, to overseas students/officials to access these facilities. A fair number of students also travel overseas, both within and outside the region, for higher education/ specialised training. A more focussed programme can be conceptualised to create preferential access for regional applicants in institutions which will be partners in a regional network. Governmental funds, to the extent it can be generated, can also be used to promote exchange of faculty for sustained capacity building.

11. Market Access

These domestic policy initiatives must be supported by international action by ensuring continued and increased market access in the developed countries for the export products from the developing countries.

TABLE A2

TELEPHONE LINES IN THE ASIA-PACIFIC REGION

	Main telephone lines per 100 inhabitants	
	1995	*1999*
Afghanistan	0.15	0.13
Bangladesh	0.24	0.34
China	3.30	8.58
Korea (DPR)	4.98	4.64
India	1.29	2.66
Indonesia	1.69	2.91
Iran (IR)	8.30	12.53
Malaysia	16.57	20.30
Myanmar	0.36	0.55
Nepal	0.41	1.13
Pakistan	1.67	2.22
Philippines	2.05	3.88
Sri Lanka	1.14	3.64
Thailand	5.86	8.57
Vietnam	1.05	2.68
Hong Kong SAR	53.25	57.57
Korea (Rep.)	41.24	43.79
Singapore	41.20	48.20
Taiwan-China	43.07	54.52
Australia	49.25	51.97
Japan	48.66	55.75
New Zealand	2.20	47.34
Asia-Pacific Total	**8.51**	

Source: ITU.

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