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**The Nature Of Telecommunications Revolution
In The Developing Countries In Asia :
Its Impact On The Economy**

By

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AMIC-CSD-WACC Seminar on The Communication Revolution in Asia

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by

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During the world's biggest telecommunications exhibition organized by the ITU in Geneva in 1983¹, the then Chairman of the world's largest operator of telecommunications² made some very pertinent and interesting remarks on the subject matter of this Seminar and I would like to quote him here:

- "..... a revolution is taking place in communications technology. Innovation in telecommunications technology is proceeding at a dizzying pace, creating a dazzling array of new products, services and capabilities. Each new generation of technology tends to offer not only greater speed, capacity and versatility in the transporting and processing of information - but also lower unit costs. The driving force of this revolution, of course, is the convergence of communications and computer technology which is literally redefining the telecommunications industry. Fundamental changes are starting to occur in our concepts of telecommunications. No longer is a telephone simply an instrument for voice communications but rather an information terminal, a means of assessing and exchanging information in a variety of ways, to and from a variety of sources. No longer a television simply a passive instrument for receiving news and entertainment but rather an interactive communications device, visually displaying transactions that are taking place electronically. No longer a PABX simply an instrument for routing telephone calls in and out of offices but rather a multipurpose office management system, supporting a variety of operation, from inventory control to energy management. No longer is a telephone line simply a telephone line but rather a multipurpose information pipeline, linking people to people, people to machines or machines to machines."

Two important points are made here. Firstly, revolution has taken place in the communications technology and secondly the concept of telecommunications are changing. The development and the changes in technology have been very much dominant in the past two decades during which period almost exponential technological advances took place. What has been happening around us has been described variously as a space age, electronic revolution, information age and so on. The pattern of technological innovations and applications, the magnitude of the advances streaming forth from the research laboratories, and the speed in which these are approaching us in every walk of human life, is truly more dramatic and more exciting than anything we have known in all the past history. In the socio-economic scene, telecommunications is responding in infinite ways to the complex communications needs of the information-hungry society all round. The debate whether telecommunications are needed for social and economic development is not as commonplace as it used to be. While some search is still going on for quantitative indicators of relationship between telecommunications and social and economic development, telecommunications are definitely accepted as an absolute necessity, a prerequisite and a

1. World Telecommunication Exhibition: TELECOM 83, Geneva, 25-28 October 1983

2. Charles L. Brown, Chairman of the Board, AT&T Company, NY, USA.

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pre-investment for development and as a barometer of social and economic health of communities.

With the advances made in computer-communications link up, micro-electronics technology with incredible energy savings potential, largescale, efficient and versatile satellite communications systems, application of fibre optics and digital technology, telecommunications are without doubt taking us towards new possibilities with unimaginable range of usages and applications. Technology already seems to be developing elements and blending them in an infinite number of ways to give us what may constitute a qualitative revolution in communications, surpassing all known traditional boundaries and limitations. The array of new service possibilities in the future is indeed staggering, judging from the great variety of pre-requisites that are emerging from the domain of research and development and are being assembled for service requirements.

In terms of telecommunications concept, the single most important recent development is the concept of Integrated Services Digital Networks (ISDN). This is a network which provides or supports a wide range of different telecommunications services by means of digital connections between a limited number of types of standardized user-network interfaces. Microelectronics and transmission media have opened up a whole range of possibilities for voice, text, data and image communications and the subscriber demand for new forms of communications is increasing as technical know how progresses. Such demands can only be met in the long run by means of a general, universal communications network allowing different types of networks to be combined and permitting many types of communication services, especially the new ones. The ITU and many of its member administrations are working expeditiously to translate the concept into a reality.

The assertions made above relate to current situation in the developed world where telecommunications are taken for granted as a part of day-to-day life. What is the situation in Asia? The trend is far from similar but again very much diverse. The Asia-Pacific region continues to be one of the fastest growing regions of the world. ~~The general~~ performance of a number of developing countries have been spectacular in the past years. In line with the economic development, a similar trend has been noted in the development of telecommunications services in the region. During the past decade the number of telephones in Asia increased at an annual rate of about 7.4 per cent, a figure that remained remarkably constant throughout that period. An analysis of the growth statistics of the Asia-Pacific during this period shows a reasonable correlation between the growth rate of telephone installations and the gross national product of most countries. In countries that have already reached comparatively high telephone densities, the annual growth is somewhat less than the general average (e.g. Australia, Hong Kong). On the other hand, countries with rapidly growing GNPs and low telephone densities tend to have telephone growth rates higher than that of the average (Malaysia, Thailand). A comparative and recent situation of growth of telephones for a number of developing countries in Asia are shown in annex I. The telephone density situation along with other statistical information on a global basis was published in the Maitland Commission Report in 1984. This information is reproduced in Annex II. The figures in Annex II clearly shows that in spite of the steady pace of growth, the number of telephones per 100 population in Asia rests at a level far below that of the industrialized countries. Even in upper middle income economies in Asia stand at level much below the industrialized market economies. The situation in lower and middle income economies of the region presents even wider disparities.

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The poorer of the heavily populated and import-dependent developing countries in Asia are indeed faced with different choices and dilemmas. While technology promises developing countries to progress rapidly into the future, the socio-economic realities strongly continue to be a drag. It is true that technology offers a variety of choices and options. But in the ultimate analysis, search for priorities must become a matter of attainable socio-economic goals and resource optimisation in the total perspective.

In 1982, the ITU Plenipotentiary Conference, which is the Supreme Organ of the Union, having thoroughly debated the issue of telecommunications and development on a worldwide scale, decided to establish an Independent Commission to look into the subject. That Commission whose mandate included, inter alia, the examination of the totality of existing and possible future relationship between countries in the field of telecommunications, was requested to recommend a range of methods including the novel ones for stimulating telecommunications development in the developing world. Having made a thorough study of the situation in the developing countries, the Commission in its report "The Missing Link" published in early 1985, describes the development situation in the developing countries in the following words:

"The world telecommunications network is one of the great human achievements. It links every country in the world. It services 600 million telephones and provides telex and data services. According to figures available to the ITU, the combined yearly revenues of the world's telecommunications administrations are currently some US\$250 billion and their combined yearly investment programmes amount to about US\$100 billion.

"There is however an immense disparity in the extent of telecommunications service and in its quality as between industrialized countries and the developing world. ~~More than half of the world's population live~~ in countries with fewer than 10 million telephones between them and most of these are in the main cities: two-thirds of the world population have no access to telephone services. Tokyo has more telephone than the whole of the African Continent, with its population of 500 million people."

The Commission in its Report included a series of recommendations aiming at stimulating the growth of telecommunications in the developing world.

One of the important recommendations related to the establishment of a Centre for Telecommunication Development within the framework of the ITU. The basic mandate of the Centre is "a new multilateral focal point to strengthen and expand the scope and extent of advisory services and technical support to developing countries with a view to remedying, through innovative effort, the imbalance in the distribution of telecommunications in the world". ITU has taken expeditious action to complete all necessary preparatory work so that the Centre may start functioning before the end of 1986.

On the question of economic impact of telecommunications, I would like to quote one of the conclusions reached by the Independent Commission:

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" In the industrialized world, telecommunications is taken for granted as a key factor in economic, commercial and social activity and as a prime source of cultural enrichment. Our study of the role (which intangible benefits of telecommunications) can play has persuaded us that telecommunications can increase the efficiency of economic, commercial and administrative activities, improve the effectiveness of social and emergency services and distribute the social, cultural and economic benefits of the process of development more equitably throughout a community and a nation. We have no doubt that any further research in this field will corroborate our view".

With the publication of the ITU report Information, Telecommunications and Development in February 1986, one more piece of evidence is added to the growing body of research that telecommunications cannot be neglected in the development process. A number of points emerge from this publication which support the position that telecommunications has a significant, measurable impact. Firstly, it has been found by researchers in a number of countries where studies were conducted that substantive benefits are associated with telephone calls from public call offices in rural areas. While talking about rural telecommunication, it is interesting to note from a report published in the magazine "Telephony" (USA) of 24 August 1986 that a new U.S. law may boost telecommunications development in the Third World. The new law requires the U.S. executive directors of the World Bank and of three other multilateral banks vigorously to promote a shift in the banks' lending priorities. In place of largescale, capital-intensive projects, which often have had disastrous environmental effects, the law mandates U.S. support for smallscale, environmentally beneficial and culturally appropriate projects including rural and mobile telecommunications systems. The U.S. legislation provides an important tool for those development experts throughout the world who have long argued that telecommunications investments are one of the most cost-effective catalysts for stimulating balanced economic growth. Coming back to economic impact, the second point relates to aggregate economic gains associated with telecommunications, particularly for business establishment. For example, the cost savings and efficiency gain through the use of telecommunications are significantly high. Thirdly, evidence indicates that all strata of the population benefit from the availability of telecommunications facilities, not just the upper middle class.

The ITU has long recognised that it is extremely desirable to seek to quantify the benefits that accrue from the use of telecommunications services in order to be able to determine the magnitude of investment spendings on this sector. Considering the diversity of the environments and the complex interaction of the various casual factors, it is not possible to give specific figures that are universally applicable. However, as more and more studies and research are conducted, the picture is becoming clearer. Extensive field studies in the late 1970s and early 1980s have amply demonstrated that appropriate telecommunications is an essential element for socio-economic development. The direct and indirect benefits of telecommunications far outweigh the investment and operational costs incurred. At this stage, however, a note of caution may be in order. Although it is relatively clear the overall benefit of telecommunications is great, one needs to exercise care when

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comparing benefits with the investment cost, because the former are mainly realized in local currency whereas a great part of the latter must be paid for in hard currency by developing countries.

Before this paper is concluded, I would like to revert to the subject of communications/information revolution and mention some of the complex issues that we face while we march through the development process. These I quote from the same author with whose quotation this article commenced:

".....How can we see to it that the information revolution does not bypass the lesser developed countries of the world, as was the case with the industrial revolution?

.....How can we effect the transfer of communications technology from the haves to the have-nots under terms that are affordable to those who need it and equitable to those who invested so heavily to create it?

.....How we accommodate increased diversity in services and supplies without excessive fragmentation of national and international communications infrastructures?

.....How can we create sufficient incentives to get nations to cooperate in the development of largescale, multicountry network management scheme?

The answer to these issues lie with the collective wisdom and influence of the world leaders and authorities. All we need is willingness- and the will - to work together to make it a reality.

ANNEX I

Expansion in the recent past of telephone in a number
of countries in Asia-Pacific
(total number of telephone stations in Thousand)

	1980	1981	1982	1983	1984	1985
Australia	7153	7870	8241	8297	8328	
China	4355	4425	4712	5072	5539	
Fiji	42	46	47	49	51	
Hong Kong	1676		1947	2041	2173	
India		3019		3238	3487	
Iran				1791	2143	2253
Japan	53624	56284	58678	61208	63976	
Malaysia	598	716	836	976	1150	1300
Newzeland	1729	1798	1875	1939	2010	2105
Pakistan	330	358	416	474	511	
Papua Newguinea	49	50	51	52	55	
Phillipines	702	730	775	787	811	850
Singapore	702	774	852	923	1003	
Sri Lanka	84		105	106		
Thailand	497	529	502	623	733	
Tonga		2.6		3.5	4	
Vietnam		97		103	106	

(Extracted from the Maitland Commission Report)

ANNEX - II

Page I

TELEPHONE DENSITY

	YEAR	POPULATION MILLIONS	AREA K Km	GDP/HEAD 1982 US\$	MAIN TELES K	TOTAL TELES K	MAIN TELES PER 100 POPULATION	TOTAL TELES PER 100 POPULATION
<u>Low Income Economies</u>								
Chad	77	4.0	1,284	80	2.4	6.5	0.06	0.16
Bangladesh	82*	90.0	144	140	113.7	122.2	0.12	0.13
Ethiopia	82	32.8	1,222	140	77.3	100.8	0.24	0.31
Nepal	82	15.0	141	170	14.3	17.4	0.10	0.12
Mali	82*	7.2	1,240	180	5.2	8.5	0.07	0.12
Burma	79	33.3	677	190	28.2	36.6	0.08	0.11
Zaire	82	29.2	2,345	190	27.2	31.2	0.09	0.11
Malawi	79	5.9	118	210	10.6	29.0	0.18	0.49
Upper Volta	78	5.9	274	210	4.0	8.6	0.07	0.14
Uganda	82	13.4	236	230	22.8	61.6	0.17	0.46
India	82	700.3	3,288	260	2295.5	3019.4	0.33	0.43
Rwanda	80	4.9	26	260	3.3	4.6	0.07	0.09
Burundi	82*	4.0	28	280	5.0	5.6	0.12	0.14
Tanzania	81	19.2	945	280	40.7	96.5	0.21	0.50
Benin	78	3.5	113	310	7.6	16.2	0.22	0.47
Central Af Rep	81	2.5	623	310	2.5	5.0	0.10	0.20
China	83	1,015.4	9,561	310	5072.0	5084.0	0.50	0.50
Guinea	77	5.1	246	310	6.6	9.5	0.13	0.18
Niger	82	5.8	1,267	310	7.0	9.8	0.12	0.17
Madagascar	81	9.9	587	320	19.3	38.2	0.19	0.38
Sri Lanka	82	15.0	66	320	67.0	105.8	0.45	0.71
Togo	80	2.5	57	340	5.8	9.8	0.23	0.39
Ghana	82*	11.5	239	360	37.2	70.7	0.32	0.61
Pakistan	83	86.3	804	380	374.0	384.4	0.43	0.49
Kenya	82	17.4	583	390	88.1	216.7	0.51	1.25
Sierra Leone	80	3.1	72	390	11.5	-	0.37	-
Afghanistan	80	15.1	646	-	25.8	31.7	0.17	0.21
Lao P.D.R.	77	3.5	237	-	5.7	6.5	0.16	0.19
Mozambique	82	12.9	802	-	36.5	57.4	0.28	0.44
Viet Nam	81	55.0	330	-	-	97.4	-	0.18
<u>Lower - Middle Income Economies</u>								
Sudan	82*	19.4	2,506	440	48.7	68.5	0.25	0.35
Senegal	82	5.9	196	490	20.0	-	0.34	-
Bolivia	78	4.7	1,099	570	-	125.3	-	2.64
Indonesia	82	153.0	1,919	580	475.5	669.3	0.31	0.44
Zambia	82	5.6	753	640	35.0	67.2	0.63	1.20
Honduras	82*	4.0	112	660	33.2	33.7	0.84	0.85
Egypt	82	43.7	1,001	690	477.4	-	1.09	-
El Salvador	82	4.9	21	700	79.1	100.0	1.63	2.06
Thailand	82	48.8	514	790	434.3	502.4	0.89	1.03
Papua New Guinea	82	3.1	462	820	25.3	50.5	0.81	1.62
Philippines	82	50.3	300	820	480.7	775.6	0.96	1.54
Zimbabwe	82	7.5	391	850	102.0	236.2	1.35	3.13
Nigeria	82*	100.0	924	860	218.0	708.4	0.22	0.71
Morocco	82	20.7	447	870	191.4	265.7	0.92	1.28
Nicaragua	82*	2.9	130	920	42.2	51.2	1.45	1.76

	YEAR	POPULATION MILLIONS	AREA K Km	GDP/HEAD 1982 US\$	MAIN TELES K	TOTAL TELES K	MAIN TELES PER 100 POULATION	TOTAL TELE PER 100 POULATION
Yemen P.D.R.	82	2.0	333	470	15.2	23.4	0.75	1.15
Ivory Coast	80	8.0	322	950	37.5	87.7	0.47	1.10
Guatemala	82*	7.1	109	1,130	97.7	-	1.37	-
Congo	81	1.6	342	1,180	-	17.3	-	1.10
Costa Rica	82	2.4	51	1,430	188.6	282.8	7.84	11.76
Peru	82	17.5	1,285	1,310	331.5	519.6	1.90	2.97
Dominica Republic	82*	5.8	49	1,330	109.1	175.1	1.88	3.01
Jamaica	82*	2.0	11	1,330	57.4	124.3	2.87	6.21
Ecuador	82	8.1	284	1,350	259.7	311.7	3.22	3.87
Turkey	82	45.4	781	1,370	1,502.0	2,368.0	3.31	5.22
Tunisia	82	6.8	164	1,390	138.6	218.8	2.05	3.24
Colombia	81	27.0	1,139	1,460	1,134.5	1,842.1	4.20	6.82
Paraguay	81	3.3	407	1,610	54.7	64.3	1.65	1.94
Angola	81	5.7	1,247	-	36.7	40.3	0.65	0.71
Cuba	81	9.7	115	-	232.1	406.4	2.39	4.18
<u>Upper Middle Income Economies</u>								
Syria	82	9.5	185	1,680	336.4	471.0	3.54	4.96
Malaysia	82	13.7	330	1,860	585.4	836.6	4.27	6.10
Korea (Rep of)	82	39.6	98	-	4,493.0	5,158.0	11.33	13.01
Panama	82	2.0	77	2,120	150.9	213.0	7.61	10.74
Chile	82	11.3	757	2,210	404.2	584.3	3.58	5.18
Brazil	82*	119.0	8,512	2,240	5,377.7	8,536.0	4.52	7.17
Mexico	82	73.3	1,973	2,270	3,118.2	5,961.4	4.25	8.13
Algeria	82	19.5	2,382	2,350	408.2	606.9	2.09	3.11
Portugal	82	10.1	92	2,450	1,149.3	1,566.9	11.39	15.53
Argentina	82	28.9	2,767	2,520	2,361.4	3,234.8	8.17	11.19
Uruguay	82*	2.9	176	2,650	226.4	294.4	7.74	10.06
South Africa	83	24.5	1,221	2,670	1,936.6	3,208.7	7.89	13.08
Yugoslavia	82*	22.5	256	2,800	1,684.4	2,303.5	7.49	10.24
Venezuela	82	16.7	912	4,140	-	1,036.8	-	6.21
Greece	82	9.8	132	4,290	2,534.4	3,113.0	25.81	31.70
Israel	83	4.1	21	5,090	1,201.3	1,415.0	29.44	34.67
Hong Kong	82	5.2	1	5,340	1,477.0	1,947.5	28.22	37.22
Singapore	82	2.5	1	5,910	630.4	852.0	25.34	34.24
Trinidad and Tobago	82	1.2	5	6,840	46.8	86.9	3.90	7.24
Iran	83	40.4	1,648	-	1,414.3	1,791.8	3.50	4.43
Iraq	82	14.0	435	-	399.6	514.9	2.85	3.68
<u>High Income Oil Exporters</u>								
Oman	82	1.5	300	6,090	19.6	31.4	1.31	2.09
Saudi Arabia	82*	7.0	2,150	16,000	607.3	788.6	8.60	11.24
Kuwait	82	1.6	18	19,870	191.0	243.0	12.20	15.53
United Arab Emirates	82	1.1	84	23,770	165.4	280.8	15.04	25.53
<u>Industrialised Countries</u>								
<u>Market Economies</u>								
Ireland	82	3.5	70	5,150	579.6	779.0	16.56	22.26
Spain	82	38.1	505	5,430	8,017.7	12,820.2	21.05	33.67
Italy	82	56.8	301	6,840	14,697.8	21,679.6	25.89	38.19
New Zealand	83	3.2	269	7,920	1,197.7	1,939.5	37.52	60.76
United Kingdom	83	56.3	245	9,660	19,549.4	29,061.3	34.75	51.66

	YEAR	POPULATION MILLION	AREA K Km	GDP/HEAD 1982 US\$	MAIN TELES K	TOTAL TELES K	MAIN TELES PER 100 POPULATION	TOTAL TELES PER 100 POPULATION
Austria	82	7.6	84	9,880	2,438.7	3,330.2	32.25	44.04
Japan	83	117.8	372	10,080	42,429.0	61,208.0	36.02	51.97
Belgium	82	9.9	31	10,760	2,745.3	3,958.9	27.82	40.12
Finland	82	4.8	337	10,870	1,928.0	2,644.0	39.83	54.62
Netherlands	82	14.3	41	10,930	5,291.0	8,025.0	36.90	55.97
Australia	82	15.3	7,687	11,140	5,480.0	8,241.0	35.87	53.95
Canada	82	24.6	9,976	11,320	10,335.4	16,802.4	46.02	68.30
France	82	54.3	547	11,680	19,327.7	29,373.7	35.62	54.14
Germany Fed Rep	82	61.6	249	12,460	22,712.6	31,370.1	36.87	50.93
Denmark	82	5.1	43	12,470	2,351.0	3,555.0	45.95	70.27
United States	82*	231.0	9,363	13,160	94,457.0	181,893.0	40.84	78.74
Sweden	82	8.3	450	14,040	4,965.9	7,131.9	59.63	85.64
Norway	82	4.1	324	14,280	1,387.9	2,203.7	33.67	53.45
Switzerland	82	6.5	41	17,010	3,021.0	4,977.0	46.71	76.95
<u>East European Nonmarket Economies</u>								
Hungary	82	10.7	93	2,270	655.0	1,338.0	6.12	12.50
Romania	79	22.0	238	-	1,480.0	-	6.71	-
Bulgaria	82	9.0	111	-	1,144.3	1,513.9	12.74	16.86
Czechoslovakia	82	15.4	128	-	1,720.0	3,306.0	11.19	21.51
German Dem Rep	82	16.7	108	-	1,437.3	3,344.3	8.59	19.99
Poland	82*	36.0	313	-	1,970.6	3,505.7	5.46	9.72
USSR	82	271.2	22,402	-	24,540.0	26,667.0	9.05	9.83

Source

1982* figures are from The World's Telephones (AT&T) 1982.

All others are from the Yearbook of Common Carrier Telecommunication Statistics 11th Edition and the World Development Report 1984.

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