



INTERNATIONAL TELECOMMUNICATION UNION

## **Role of telecommunications in economic, social and cultural development**

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### Study Period 1995-1998

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- Report on Question 1/1** Role of telecommunications in economic, social and cultural development
- Report on Question 2/1** Telecommunication policies and their repercussions at the level of institutional, regulatory and operational aspects of services
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## Role of Telecommunications in Economic, Social and Cultural Development

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## REPORT ON QUESTION 1/1

**Role of Telecommunications in Economic,  
Social and Cultural Development**

The World Telecommunication Development Conference, Buenos Aires (1994) identified the “Role of Telecommunications in Economic, Social and Cultural Development” (Question 1/1) as a topic for study by ITU-Development Sector Study Group 1:

“in order to provide political decision makers with an overview of the role played by telecommunications in a country’s economic, social and cultural development, whatever studies and information are accumulated by other countries should be shared, with a view in particular to quantifying the economic benefits of including the telecommunication sector in general national or regional development plans.”

Recognition of the importance of telecommunications for development is becoming more widespread, but it is by no means universal. In the industrialized world, telecommunications is regarded as an engine of growth and is recognised as a key factor in economic, commercial and social activity, and the telephone network extends to all but the most sparsely populated areas. In stark contrast, in the developing world, telecommunications systems are inadequate to sustain basic activities. The purpose of the study was to generate information to carry the evidence to the decision makers – national planners and those responsible for communications, information access and dissemination in other sectors – in short, to make telecommunications an intrinsic part of the development debate. The objective was to assemble the currently available evidence to assist decision makers to assess the effects of a nation’s investment in telecommunications on economic development and social and cultural well-being of the population.

This report is divided into two parts. The first part deals with the economic impact of telecommunications and reviews the macroeconomic and microeconomic evidence of the benefits and discusses a number of case studies relating to cost saving, increased income and efficiency gains effects of telecommunications. The second part focuses on the role of telecommunications in promoting social and cultural cohesion. A number of studies indicate a positive relationship between the spread of telecommunication services and economic development and structural change. Investment in telecommunications contributes to cost savings, increases income, and enhances general business efficiency but also, more importantly, such investments help to maximise the benefits of other infrastructure investments. The impact of telecommunications becomes more pronounced, the more remote a region is.

At the same time, the development of modern telecommunications plays an important positive role in maintaining and strengthening social and cultural cohesion. Such impact implies that development policies both at the national and the international level take more explicitly into account the social dimension of the access to modern telecommunications.

## PART I

**Economic impact of telecommunications****1 Introduction**

The average teledensity for the world is 11.57. However, the distribution varies from 52 in the High Income Group countries to 1.48 in the Low Income countries. More than half of the world's population does not have access to a telephone. The share of 59 low income countries in the world's telephone mainlines is 7%, although these countries account for about 56% of the world's population. The gap between the telecommunication facilities of developed countries and the least developed countries is much starker. The average level of teledensity among the Least Developed Countries (LDCs) is 0.29 or just one phone for every 350 people. The total number of telephone main lines in the 48 LDCs stands at just over 1.5 million (see Note). This is 1% of the total number of lines in the United States, while the US population is less than half that of all LDCs combined. The aggregate figures on teledensity in developing countries hides geographical disparities, concentration of facilities in urban areas, long waiting periods for telephone connections, and generally poor service quality. Many networks are overloaded and so badly maintained that only a small percentage of call attempts succeed.

NOTE – Some aspects of the status of telecommunications in the least developed countries are:

- Excluding South Africa, sub-Saharan Africa has on average 0.48 telephones for every 100 inhabitants, compared with roughly 60 telephones per 100 Americans. In Zimbabwe, some 400 000 people are said to be waiting for a line to be installed.
- 12% of the world population (in Africa) has only 2% of the world's main telephone lines; some 70% of Africa's population live in rural areas served by only 228 000 lines.
- Most LDCs cannot meet potential or actual demand for telephone lines: as more than one million are registered to wait for a telephone line, it would take at current network expansion rates almost 13 years to eliminate this backlog, let alone provide service for countless others who may want to apply in the meantime for a telephone.
- At current prices, it will require US\$ 28 billion to achieve the goal of installing a line for every 100 inhabitants in sub-Saharan Africa – if installation costs could be brought down to global industry norm, the same goal could be realised for a mere US\$ 8 billion.
- There is a lack of adequately trained personnel at all levels of the telecommunications infrastructure, exacerbated by the demands of rapidly changing technology and techniques; insufficiently trained personnel prevents full benefits being realised from the investments made; poor training is reflected in poor productivity (on average one employee supports 16 lines, which is only 12% of world average); regional telecommunications training centres in Africa have not enjoyed the sustained commitment of donors.
- Poor planning reduces capacity utilisation.
- There is an absence of market orientation and responsiveness by telecommunications operators in LDCs; they are strictly regulated and cannot plan and invest as a commercial organisation would; this is compounded by poor revenue collection, inadequate logistics support, demotivated staff and rampant pilfering of resources.
- There is an even more staggering gap between urban and rural areas. In some LDCs, the rural main line density is lower than 1 per 1 000, with large areas of territory without any telephones.

There is growing and wide-spread recognition that telecommunication is an essential catalyst for growth. Yet improved telecommunication generally has not been a central investment focus for developing countries. Developing countries usually invest less than 1% of their investment on telecommunications, compared to 2% in industrialized countries. The reasons for underinvestment are not necessarily due to lack of profitability of the telecommunication entities, which indeed make a healthy profit and contribute to the state exchequer. The major explanation for underinvestment is control and ownership.



Telecommunication authorities are state enterprises in most countries. As such, they are subject to the normal budgetary practices of governments and have to compete for budget allocations from the state along with other areas of governmental activity. In such a situation, funds are not allocated on the basis of economic criteria, as they would be if the telecommunications entities were competing in the market for funds. In other words, the gains associated with telecommunications investment are ignored, underestimated or simply unknown.

Returns from telecommunications investments may be underestimated because:

- the externalities associated with an expanded telecommunications infrastructure are not recognized;
- the government may regard the telecommunications as a facility for the rich;
- the government has other pressing social and political objectives.

## 2 Examples of the Impact of Telecommunications

The benefits of telecommunications in terms of contributing to personal, occupational communications, emergency situations, delivery of social services, enhancing the efficiency of business and conservation of resources are well known (see Note). The advantages of extending telecommunications to remote and rural areas of countries – developed and developing – are now widely recognized:

NOTE – Study Group 1 Q 1/1 – Contribution by INMARSAT, Universal Service Obligations – A Solution to Universal Service.

- Information flows constantly through a myriad of channels. Administrative, commercial and official correspondence, conversation and other communications are the indispensable basis of government and business activities. A modern state cannot function without them.

NOTE – Study Group 1 Q 1/1 – Contribution by Uganda.

- Extending telecommunications to remote areas helps to link people together, to provide a means of contact between families and friends separated by distances. With 70% or more of populations of developing countries living in rural areas, political leaders increasingly see universal service as a political priority in uniting their country. For many developing countries, telecommunications represent a tool of national and regional integration and development.

NOTE – Study Group 1 Q 1/1 Contribution by Chad; Study Group 1 Q 1/1 Contribution by Mauritania.

- Telecommunications provides a means of extending social services such as health care and education to those who otherwise might have to move to urban areas to get them. In other words, telecommunications can help slow or even reverse migration to the cities.
- The availability of telecommunications improves security. Citizens at risk or in an emergency can call the police for help. Civil guards, customs and immigration officials can more effectively monitor remote border points and they too can call for assistance when necessary.
- Telecommunications play a vital role in environmental protection. They can be used to monitor pipelines and river levels. Mobile telephones can help park and forest rangers in combating poaching and illegal felling of trees.
- Disasters – whether natural, such as volcanic eruptions, floods, earthquakes or man-made such as oil spills, radiation leakages, forest fires – often occur in remote areas. Telecommunications can help mitigate the destructive consequences.
- Telecommunications is a necessary and basic infrastructural requirement for companies and industries interested in developing a country's natural resources, such as oil, gas, forestry, etc., which in turn increases employment opportunities. International telecommunications is an indispensable part of any country's participation in the global economy, for supporting international trade and strengthening cultural contacts.

A number of studies indicate a positive relationship between the spread of telecommunication services and economic development and structural change. Investments in telecommunications contribute cost savings, increase income and enhance general business efficiency but also, more importantly, such investments help to maximise the benefits of other infrastructure investments. The impact of telecommunications becomes more pronounced, the more remote a region is. Examples of the impact of improved telecommunications abound. The following are indicative of the positive relationship between improved telecommunications and increased economic activity.

NOTE – Telecommunications Sector Scoping Study for Southern Africa. Phase I – Draft Report, Teleconsult Inc., Washington, D.C., International Telecommunications Consultants, October, 1992.

- The introduction of telephone service into the rural agriculture villages of Chichicastenango in Guatemala allowed small farmers to obtain information on the current prices of fruits and vegetables in Guatemala City, the main market, and at Puerto Barrios, the main export point. The more current information allowed the farmers to increase the price charged for their agricultural produce by 50% in Guatemala City and 75% in Puerto Barrios. They were also able to negotiate with several exporters simultaneously for the highest price for their products. Prior to obtaining telephones, the farmers only provided products to one exporter at a fixed price.
- A chicken farmer in Bucaramanga, Colombia, was able to arrange direct delivery of eggs and chickens to residential and commercial markets outside his local area after the introduction of telephones. He was able to respond on a daily basis to changing market requirements and arrange direct delivery of a perishable product.
- The program to extend the banking system in rural Costa Rica included expanded telephone service. This permitted rural farmers to more effectively determine the market price for their products at several locations, instead of depending on only one local market, or trucker. They were also able to purchase fertilizer and other goods at lower prices from competing markets.
- The installation of solar-powered roadside telephone service in Egypt permitted truckers to call for emergency repairs, or replacement vehicles, which would be of critical importance for vehicles containing perishable commodities under the hot desert sun.
- In El Salvador, the Interior Minister required daily information from the major cities and provinces. Due to the inadequate and damaged telephone service, a weekly trip by 42 Interior employees to San Salvador, the capital city, was required. When the telephone service was repaired in the rural areas, many time-consuming and dangerous trips were eliminated.
- In San Pedro Sula, Honduras, exporters are able to arrange deliveries of bananas to the docks to meet the arrival of cargo ships. This limits the exposure time for the highly perishable commodity and increases the productive output of the farmers.
- In Puntarenas, Costa Rica, a new international tourist hotel opened before adequate telephone connections were installed. The hotel had an excellent beach and other resort facilities. However, the hotel had a low occupancy rate since most travellers required access to continuous telephone communications to the outside world, for business or personal needs. The unexpected delay caused the initial hotel developers to sell the hotel at a loss. The new owners were able to obtain world-class telephone service and the hotel is now operating at maximum capacity during the peak season, and at 60% capacity in off-peak periods, with a strong business clientele.

**Box 1****Role of international telecommunications in manufacturing and export of services**

International telecommunication facilities are the life-blood of trade, manufacturing, mining, tourism, financial and banking services – and a crucial determinant of the strategies of international firms and the export-oriented efforts of developing countries.

Texas Instruments, Singapore, relies on INTELSAT's high speed digital circuit to communicate with its headquarters in Dallas, Texas. The Singapore factory runs seven days a week, 24 hours a day. Continuous inputs are made into the mainframe computers for real-time information and production data which are vital to business decisions and manufacturing operations, hence the circuits must be available at all times. Approximately 140 000 transactions for information are made each day. The 62 TI locations around the globe are each networked to facilitate data and information sharing among TI personnel.

Communication satellites' role in the delivery of long distance services are exemplified in the R&D and production ventures in Bangalore, India, by a U.S. based company – Texas Instruments – and the Software Technology Park (STP) scheme established by the Government of India under the Department of Electronics to promote exports of computer software. The TI subsidiary in India, develops software programmes for computer-aided design of integrated circuits and transmits the programme electronically to the United States using an INTELSAT IBS link through two F2 standard earth stations.

It is no exaggeration to say that international telecommunications is the cornerstone on which India's highly successful software industry is built. The industry grew at a compound annual growth of 55% in the last five years. During 1997-98 the industry is expected to earn revenues of US\$ 2.8 billion (see Note). Software Technology Park scheme is a 100% export-oriented scheme for the development and export of software using data communications links or in the form of physical media including export of professional services. Established in Bangalore, Pune, Bhubaneshwar, Thiruvanthapuram, Hyderabad, Noida, and Gandhinagar, the STPs act as export-oriented resource centres for the member computer software exporting units by offering general infrastructural facilities like power, ready to use built-up space, centralised computing facility and High Speed Data Communication facility. STPs also perform other functions for the members acting as a single point interface such as the issuance of import certificate, software evaluation, and attestation of export declaration. An INTELSAT IBS link through F3 standard earth station are used by the STPs in their offshore software development projects. Expansion plans are afoot to install a Standard B earth station to handle the growing export service industry.

NOTE – *Financial Times*, 3 December 1997.

Source: Study Group 1 Q 1/1: Contribution by INTELSAT.

Recognition of the benefits that telecommunications can bring and the need to distribute the benefits evenly is at the heart of policy initiatives relating to providing universal service, particularly in the developed countries. Generally, universal service provision has meant the extension of telecommunications to remote and rural areas of countries so that everyone either has the option of a telephone or is in easy reach of one (see Note 1). In some countries, universal service obligations include provision of service to particular segments of the society, e.g. disabled and elderly as well as the under-privileged in urban areas or at the particular level of technological facilities (see Note 2). "Affordability is crucial to the extension of telecommunications service to every citizen" (see Note 3). In Europe, it is a fundamental responsibility for national regulatory authorities to ensure that universal service is affordable for all groups of users (see Note 4) through measures such as price caps or targeted tariff schemes necessary to maintain affordability (see Note 5). The precise groups to benefit from universal service obligations vary (and will vary) from country to country, but generally it is those groups which are uneconomic to serve and which require some subsidizing (see Note 6).

NOTE 1 – The European Commission has said "the essence of universal service is access to and the provision of a defined minimum service of specified quality to all users at an affordable price, irrespective of their geographical location". Proposal for a Council Resolution on universal service principles in the telecommunication sector. COM(93) 543 final, Brussels, 15 November 1993, p. 15.

NOTE 2 – Council of the European Union has said "the concept of universal service must evolve to keep pace with advances in technology, market development and changes in user demand". In its Voice Telephony Directive issued in December 1995, the European Commission identified the scope of universal service obligations within the Union as the provision of a telephony service which will also allow a fax and modem to operate as well as the provision of operator assistance, emergency and directory inquiry services and the provision of public payphones.

NOTE 3 – Universal Service for Telecommunications in the Perspective of a fully liberalised environment: Communication from the European Commission. COM(96) 73. Brussels, 13 March 1996, p. 6.

NOTE 4 – COM(96) 73. Brussels, 13 March 1996, p. 10.

NOTE 5 – COM(96) 73. Brussels, 13 March 1996, p. 21.

NOTE 6 – “Just because a potential telephone customer, even a rural customer, is not receiving telephone service today, this should not automatically be taken to imply that a subsidy is needed for that particular customer or category of customers”, *The Changing Role of Government in an Era of Telecom Deregulation*, Report of the Second Regulatory Colloquium, ITU, 1-3 December 1993, p. 54.

Operationalization of the concept of universal service has to be flexible if it is to be economically and socially relevant, and benefits of telecommunications have to be fully realized. Given that teledensity in the developing countries is not likely to approach the levels of advanced economies in the foreseeable future, the low density should not be an obstacle to spreading benefits that the technology brings if the objective is provision of “universal access” and not “universal service” as in the advanced economies. The industrialized country model of universal service assumes a high density of phone connections and, particularly in the context of new electronic services, is based on personal ownership of computers and modems and payment, for example, for an individual Internet connection. Universal access, on the other hand, is based on the concept of sharing of resources: the computers are owned by the community centres, they are accessed by multiple users and individuals pay only for the time they utilize the services.

NOTE – J. Ernberg, Universal Access through Multipurpose Community Telecentres: A Business Case, Paper presented at the Global Knowledge Conference: GK-97, Toronto, 22-25 June 1997.

### 3 Telecommunications and Economic Growth

The role of telecommunication in the national economic infrastructure and the question of how it would improve the efficiency of supply of goods and services or reduce their cost and thus contribute to economic growth has engaged the attention of the ITU since the 1960s. The objective was to promote the understanding of the role of telecommunications in the national economic infrastructure by generating quantitative evidence that would go some way towards reducing the isolation of telecommunications from other areas of policy making. In the 1980s, the ITU established a small unit to carry out studies on the role of telecommunication in development. A number of studies were conducted and published.

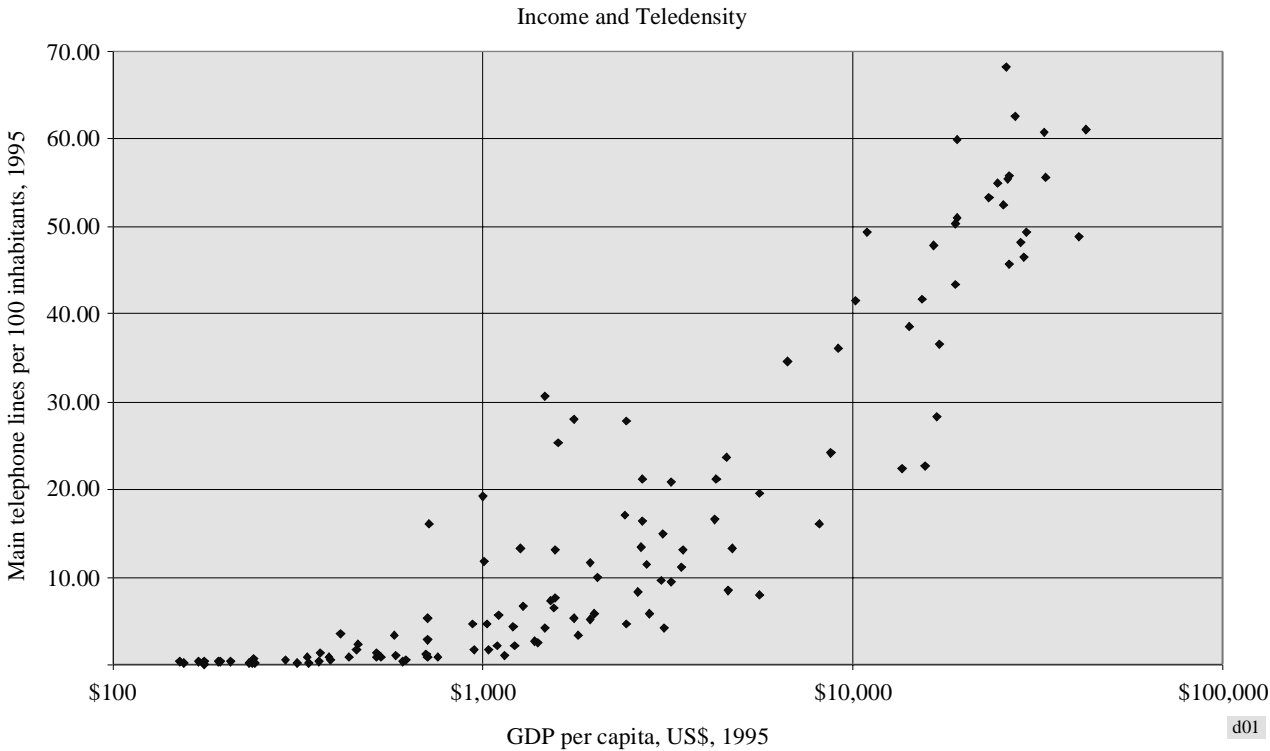
NOTE – Studies conducted include: Telecommunication for Development, 1983; Information, Telecommunications, and Development, 1986; Benefits of Telecommunications to the Transportation Sector of Developing Countries: A Case Study in the People’s Democratic Republic of Yemen, March 1988; Contribution of Telecommunications to the Earnings/Savings of Foreign Exchange in Developing Countries: Case Studies of 20 Kenyan Firms, 1988; Socio-Economic Benefits of Improved Telecommunications in Developing Countries: Results of a Research Study in Vanuatu, 1988. Telecommunications and the National Economy: A Quantitative Study Using a Macro-economic Cross-sectional Analysis, 1988. In addition, the GAS Groups of the CCITT conducted the following studies: GAS-5 Handbook: Economic Studies at the National Level in the Field of Telecommunications, 1968; GAS-5 Handbook: Economic Studies at the National Level in the Field of Telecommunications, 1976; GAS-5 Economic Studies (1981-84): Optimum Allocation and Use of Scarce Resources in Order to Meet Telecommunication Needs in Urban or Rural Areas of a Country, 1984; GAS-5 Economic Studies (1981-84): Socio-Economic Aspects of Telecommunications Development in Isolated and/or Underprivileged Areas of Countries, 1984.

There are two distinct approaches to study the effects of telecommunications on economic development. One uses the macroeconomic approach, the other uses the microeconomic approach. Both have value as well as limitations. Macroeconomic analysis, based on national aggregate statistical data, provides an overview of the basic economic indicators, but cannot explain causal relationships. Microeconomic analysis can substantiate the positive effects of telecommunications in a specific situation, industrial sector or region, but is dependent on the small sample size analysed and cannot be projected onto a larger universe, without major qualifications.

The efforts to document the relationship between GDP per capita and telephone density have a long history beginning with Jipp (see Note 1). The data for all countries in the world, from the least to the most developed, fall within a small band along a straight line on a logarithmic chart, with some exceptions. Such aggregate analysis provides some insight into the relationship between the economic status and telecommunications, but has severe limitations relating to (a) comparability of data; (b) high level of aggregation (see Note 2).

NOTE 1 – A. Jipp, “Wealth of Nations and Telephone Density”, *Telecommunication Journal*, July 1963. Recent statistical tests for the direction of causality attempt to show that the growth of telecommunication penetration is a statistically significant predictor of economic growth and vice-versa: indicators of economic growth are significant predictors of telecommunications investment. Telecommunications is thus considered to be both a cause and a consequence of economic growth. Norton concludes, “the data in this study ... are consistent with the proposition that telephones provide substantial growth – and investment – enhancing activity and thus facilitate economic growth”. See, Norton, S., “Transaction Costs, Telecommunications, and the Microeconomics of Macroeconomic Growth”, *Economic Development and Cultural Change*, 1992.

NOTE 2 – For an extensive discussion of the limitations of this approach, see L. Gille, Growth and Telecommunications, in Information, Telecommunications and Development, ITU, 1986.



Several correlational studies indicate some relationship between telecommunications and national development measured in gross domestic product and other indicators. Such relationship, however, is insufficient to assess the actual contribution of telecommunication to development and the level of telecommunications required for a given state of development.

TABLE 1

GNP per capita	Telephone density	Contribution of one telephone to GNP $S_T$		Annual costs per telephone $E_T$ (US\$)	Contribution/cost ratio $R$ (X:1)	Contribution of one call to GNP $S_C$ (US\$)	
		Percentage (%)	Absolute (US\$)			1,000 C/T	3,000 C/T
GNP/P (US\$)	D (T/100P)						
100	0.14	–	11,803.73	252.45	46.8	11.80	3.93
200	0.36	0.000096093	5,549.59	247.98	22.4	5.55	1.85
300	0.62	0.000048400	3,726.97	245.41	15.2	3.73	1.24
400	0.91	0.000031412	2,875.28	243.41	11.8	2.88	0.96
500	1.22	0.000022117	2,384.30	242.59	9.8	2.38	0.79
600	1.56	0.000014473	2,065.03	241.06	8.7	2.07	0.68
700	1.90	0.000010623	1,840.47	240.11	7.7	1.84	0.61
800	2.27	0.000010005	1,673.58	239.28	7.0	1.67	0.56
900	2.65	0.000007640	1,544.40	238.28	6.5	1.54	0.51
1,000	3.04	0.000004753	1,441.19	237.91	6.1	1.45	0.48
2,000	7.56	0.000002694	967.96	233.70	4.1	0.97	0.32
3,000	12.86	0.000001362	796.35	231.27	3.4	0.80	0.27
4,000	18.76	0.000000362	702.17	229.57	3.1	0.70	0.23
5,000	25.14	0.000000383	640.53	228.25	2.8	0.64	0.21
6,000	31.91	0.000000369	596.04	227.18	2.6	0.60	0.20
7,000	39.08	0.000000301	561.89	226.28	2.5	0.56	0.19
8,000	46.55	0.000000298	534.54	225.51	2.4	0.53	0.18
9,000	54.33	0.000000190	511.95	224.82	2.3	0.51	0.17
10,000	62.38	0.000000213	492.84	224.21	2.2	0.49	0.16
11,000	70.68	0.000000167	476.37	223.66	2.1	0.48	0.16
12,000	79.22	0.000000152	461.97	223.16	2.1	0.46	0.15
13,000	87.98	0.000000093	449.23	222.70	2.0	0.45	0.15
14,000	96.96	0.000000054	437.83	222.28	2.0	0.44	0.15
15,000	106.14	0.000000053	427.55	221.88	1.9	0.43	0.14
16,000	115.51	–	418.21	221.52	1.9	0.42	0.14
17,000	125.07	0.000000017	409.67	221.17	1.9	0.41	0.14
18,000	134.80	0.000000017	401.81	220.84	1.8	0.40	0.13
19,000	144.70	–	394.55	220.54	1.8	0.39	0.13
20,000	154.76	–	387.81	220.24	1.8	0.39	0.13

The table above presents the results of a study based on demographic and economic data from 113 countries and telecommunication data from 76 countries, during the period 1973-83 (see Note). The fact that the data is dated does not detract from the validity of the observation as they, nonetheless, provide insights into the development of national economies at different stages.

NOTE – ITU, Telecommunications and the National Economy: A Quantitative Study Using a Macroeconomic Cross-Sectional Analysis, ITU, 1988.

The results show that there is a statistical correlation between the gross national product per capita and the telephone density. One might be tempted to interpret the statistical correlation as a proof of causation, but macroeconomic aggregate numbers (or their derivatives like averages or ratios) do not explain any causality nor any direction of influence.

To interpret them correctly, one has to remember that they do not refer to all countries in the world, that the applied methodology of regression analysis does not “prove” anything and that some of the assumptions underlying the various ratios were weak.

As well, it has to be borne in mind, that the correlation between a country’s GDP per capita and teledensity does not constitute a sufficient basis for assessing the two terms of the relations: one, what telecommunications contribute to development, and, two, the level of telecommunication networks and services required for a given state of development and economic structures.

NOTE – ITU, Information, Telecommunications and Development, 1986.

With these *caveats*, the following major inferences can be drawn from the table above.

- Between 1975 and 1983, there was no change in the fact that 70% of the GNP of the countries analysed was produced by only 25% of the population of these countries.
- Over the same time period, the “rich” countries were able to increase their GNP as measured in per cent of the world’s GNP, the “middle” countries stayed even and the “poor” countries earned a smaller percentage of the world’s GNP.
- A per capita increase of the GNP from US\$ 100 to US\$ 20,000 is accompanied by changes in the average share of the various economic sectors in the GNP as follows: agriculture from 63% to 2%; industry from 3% to 35%; services from 35% to 63%. This reorientation occurs basically in the range between US\$ 100 and 2,000 per capita.
- The growth of the telephone density is always greater than that of the per capita GNP.
- The lower the GNP per capita, the greater the “contribution” of a telephone to the GNP. If the GNP per capita is for instance US\$ 100, the contribution amounts to US\$ 11,800, and in the case of a GNP of US\$ 20,000 per capita, to US\$ 390. Therefore, the less developed a country is, the higher is the influence of one telephone on the GNP.
- The contribution of a call to the GNP is US\$ 4-12 for countries with US\$ 100 per capita, and US\$ 0.10-0.40 for a per capita income of US\$ 20,000.
- The ratio between the contribution of a telephone to the GNP and the cost of a telephone can be calculated as lying between 47:1 and 2:1, depending on whether a per capita GNP of US\$ 100 or US\$ 20,000 is assumed.

#### **4 Benefits of Telecommunications: Measuring the Impact**

Microeconomic studies are designed to determine the benefits of the use of telecommunications or a telecommunication project and to compare it with the cost. The resulting ratio of benefit over cost is often used as a yardstick to assess the profitability of telecommunications.

The basic assumption in this type of analysis is that no one would use telecommunications if the expected benefit were not at least as great as the tariff paid for the usage. When a person needs to make a call, the cost to be taken into consideration depends on some different cost factors: It is not only the price that has to be paid for a call according to units of time and distance, but also – if the person does not have a private phone within immediate reach, say at home – the value of the time to get to the nearest telephone (opportunity cost of time) and the cost to reach this telephone (transport cost). Apart from that, there is always the possibility of failure of the call attempt, for example that the person to be phoned cannot be reached or that the call cannot be ended successfully because of connection problems or interruption. So there must be a personal benefit for each individual person, that must be higher than the total cost of the call, that makes people want to use the telephone instead of other alternatives.

The case study examples report the benefit/cost relationship as a benefit/cost ratio or as a consumer surplus. The term benefit/cost ratio usually refers to the total benefit (for example the cost of an alternative means of communication) divided by the price paid for the telecommunications service. Thus, if the total benefit (say \$ 3) is three times the price, it may be reported as giving a 3:1 benefit/cost ratio. The consumer surplus is often reported in absolute terms as a net benefit (cost of the alternative minus the price of the telephone call) over the price paid for service, which in this example would be \$ 2. It is also sometimes reported as a percentage, which would be 200% in this example.

For analytical purposes, the economic benefits from telecommunications can be classified into three basic categories:

- a consumer surplus which can, in theory, be directly related to subscribers' willingness to pay more than the tariffed charge for the service. As a cost saving which is available as additional disposable income to the users, the consumer surplus represents a gain to the economy beyond the financial revenues received by the telecommunications administration;
- call-related externalities (additional consumer surpluses) which are derived from cost savings or from other economic activities which the telephone enables. User willingness to pay is considered to be only a minimum indicator of the size of these benefits;
- subscriber- and non-subscriber-related externalities such as the benefits which existing subscribers receive from an expanded network. For an incremental expansion into a rural area, one indication of these benefits is the level of incoming calls, originating from existing urban subscribers, which terminate in the rural network. Another more complex effect is the benefit received by the recipients of improved social services enabled by telecommunications.

Some of the major problems faced in conducting microeconomic case studies revolve around the question of definitions of costs and benefits, in addition to the problems inherent in the collection of primary data. The experience of several studies shows the difficulty in representing benefits quantitatively – a problem invariably addressed by underestimating the benefits. In general, the inclusion of indirect benefits in the quantitative evaluation demands caution. These may be considerable and are largely consequential to the use of telecommunications, in areas such as improved information flow and market efficiency for agricultural producers, traders and distributors; improved productivity for manufacturers and service sector organizations; and improved service quality for the recipients of government and other infrastructure services. However, they are difficult to value plausibly on a consistent basis, and in most cases the benefits are contingent on other complementary activities or investments, and on increased use of the telecommunications services.

A review of relevant case study material suggests a fairly uniform view of the order of magnitude of the benefits and conditions under which they are derived. Telecommunications benefit an economy by providing cost savings, increased income and efficiency gains. In the area of transportation alone studies suggest that 10-25% of vehicle traffic can be saved if good telecommunications are available. A comparison of a number of studies indicates that, through the use of telecommunications, firms can save about four per cent of their revenues. This figure has been arrived at by disregarding transportation cost savings and excluding small firms which cannot afford a telephone while estimating the revenues that form the basis of this calculation, and is now be used as a rule of thumb calculation of cost savings for firms which can use telecommunications. Thus the total benefits from cost saving can be enormous.

Several studies show that, in actual fact, the benefits tend to be, on average, much higher. The benefit for the economy as a whole is not only the sum of all user benefits, but exceeds that by far because telecommunications has a synergy effect by assisting in the expansion of the production and exchange of goods and services (see Note 1). Telecommunications increase the overall productivity of a country in a way which could otherwise not be achieved: the country as a whole profits through higher revenues, higher taxes and increased foreign investment.

NOTE 1 – Consider the following example: market information concerning buying and selling is crucial for economic efficiency and utilization of resources. It is well known that finding the best source of supply or the consumer willingness to pay the highest price can make all the difference between a successful business and bankruptcy, or between efficient use of funds and wasting money. A study still needs to be made to qualify this effect. It may turn out that this benefit of telecommunications is more important than the increases in efficiency and the cost savings put together.



Conversely, an inadequate or poorly maintained telecommunication system entails costs. The different costs of poor telecommunications for enterprises are summarised below.

## Box 2

### The different costs of poor telecommunications in enterprises

- 1) The *business expansion costs*, which represent the costs which the lack of effective telephone service imposes upon the firm by restricting its access to consumers, suppliers and other producers. In practice, this expansion cost corresponds to the losses incurred by the firm as a result of its inability to profit from the economies of scale associated with greater production runs.
- 2) The *managerial time costs*, which amount to the monetary value of the total amount of time lost by managers in making unsuccessful calls.
- 3) The *labour time costs*, which represent the cost of the extra labour used as a substitute for effective communication (e.g. messengers, drivers, etc.).
- 4) The *inventory level costs*, or costs of carrying additional inventories as a safeguard against the delays in reordering caused by poor telecommunications.
- 5) The *production stoppage costs*, which represent the additional time lost in production stoppages as a result of poor telecommunications. These production stoppages, brought about by machine breakdowns, shortages of spare parts or unavailable raw materials, have a very high marginal cost in the short run: they lead to dramatic falls in revenue, but to very little offsetting savings in fixed costs.
- 6) The *vehicle fleet scheduling costs* resulting from the under-utilization of vehicles and the higher mileage due to the difficulty of organizing "back-loads".
- 7) The *purchase decision costs*, or costs resulting from the inability to contact a sufficiently large number of suppliers, so as to obtain the lowest price for raw materials, equipment or services.
- 8) The *selling price costs*, which represent the reverse of the purchasing decision costs: the larger the number of potential customers which can be effectively contacted, the greater the possibility of selling the firm's product at a high price (this factor appears particularly important in the case of exports of highly perishable agricultural products).
- 9) The *supply costs*, which represent the costs incurred by the firm as a result of its inability, caused by poor telecommunications, to offer on the market its total available supply of goods or services (as in the case of vacant rooms of a tourist hotel).

Source: Telecommunications for Development, ITU, 1983.

## 5 Review of Selected Case Studies

In the light of discussion above, this section focuses on a select number of studies dealing with the impact of telecommunications on particular sectors of the economy, geographical location and user categories. The case studies elaborate the contributions or the potential contributions of telecommunications to such areas as transport, organizational efficiency, enhancing foreign trade potential and export earnings, rural telecommunications and public telephones.

### 5.1 Transport Sector: Yemen

Transport vehicles represent a substantial capital investment in any country. Efficient use of vehicles can potentially contribute to substantial cost savings. A major study in the then People's Democratic Republic of Yemen, conducted by the ITU, investigated the potential benefits of telecommunications on the transport sector (see Note). The results were impressive. The study found that transportation efficiency can be improved with telecommunications services by better scheduling and the ability to inform truck drivers in a given area of loads that can be collected in the immediate vicinity, thus avoiding their returning empty. Other improvements come from faster notification of break-downs and hence faster repairs to vehicles, the elimination of spoilage on broken down vehicles, faster availability of spare parts for trucks – examples abound. It was concluded that 10-25% of vehicle traffic can be saved if good telecommunications are available. A substantive saving indeed. A similar figure is estimated for traffic with generally smaller cars in towns. Up to 25% of all traffic would not be undertaken if a message could be conveyed by a telephone. These figures provide a rough yardstick to estimate a portion of telecommunications' benefits for a country.

NOTE – Benefits of Telecommunications to the Transportation Sector of Developing Countries: A Case Study in the People's Democratic Republic of Yemen and the Generally Applicable Conclusions Drawn, ITU, 1988.

### Box 3

#### Benefits of Telecommunication to Transportation Sector

The objective of the study "Benefits of Telecommunications to the Transportation Sector of Developing Countries: A Case Study in the People's Democratic Republic of Yemen and the Generally Applicable Conclusions Drawn", (ITU, 1988) was to quantify the value of information and the effects of the availability of telecommunications on a transport system as a prerequisite for necessary budgetary decisions. The study found that the costs of transporting goods can be substantially reduced. In addition, important prerequisites for the increase of the goods-handling capacity are provided.

An increase in the load-handling efficiency was considered realistic if the following obstacles were eliminated:

- Lack of coordination of transport between different companies;
- Lack of information on incidents during transport;
- Lack of possibilities of transmitting information;
- Worn-out vehicles and insufficient level of maintenance; and
- Incapacity to control sporadic surplus production or to organize return loads in this connection.

It was computed that the following savings per annum can be realized in the country through the increased use of telecommunications (1 YD = approximately 3 US\$):

- |  |                 |
|--|-----------------|
| • Reduction (by a factor of 5 to 8) in delays caused by breakdowns | (YD: 3,888,000) |
| • Increase in the number of return loads by 10%                    | (YD: 570,000)   |
| • Reduction in losses of perishable goods                          | (YD: 52,000)    |

The PDRY experts estimated that savings resulting from telecommunications facilitating the organization of the transport and storage of goods would be at least as high as the sum of the first two points above, but would more likely be in the order of 15% of all transportation costs (YD: 4.4-10.6 million). All these effects could be achieved by comparatively low expenditure for the installation and operation of telecommunication systems along the main roads and at the dispatch centres in the P.D.R. Yemen. The installation cost of such a system was estimated to be only 10% of the expected savings from the first three points mentioned above during one year. The operating expenses would amount to about only 1% of the annual benefits. The total benefit/cost ratio was estimated at 15:1.

## 5.2 Contributions to Foreign Exchange Earnings: Kenya

Higher foreign exchange earnings are crucial for developing countries and the earnings can be maximized by promoting industries such as tourism, by exporting goods and services and effecting savings on imports.

A study, "*Contribution of Telecommunications to the Earnings/Savings of Foreign Exchange in Developing Countries*", was conducted by the ITU to investigate the contribution of telecommunications to the earnings and savings of foreign exchange in developing countries. This study tried to determine whether investment in major telecommunications projects could improve a developing country's foreign exchange position and whether the benefits in foreign exchange generation are adequate to justify the costs.

The study sought to answer this question by quantifying the foreign exchange benefits that would arise from an improved telecommunications network in Kenya. The methodology consisted in quantifying foreign exchange benefits through export gains, import savings and more efficient management. The result of the case studies has been aggregated and extrapolated to estimate the benefit to the Kenyan export sector as a whole. The study showed that such benefits would exceed the annualized foreign capital cost of the investment in the World Bank Third Telecommunications Project for Kenya, in the ratio of 3.6:1. The study also identified other indirect benefits for the country's foreign exchange balance, for example, through import substitution for products for the domestic market.

The study concentrated, through sample case studies, on the impact of shortcomings in the telecommunication services on the performances of export-oriented businesses of twenty selected companies. Ten of the twenty firms chosen for the survey were engaged in agriculture, six firms belonged to the industrial sector and four to the service sector. These

twenty businesses accounted for 17.7% of total Kenyan export earnings and 6.5% of the import costs. The potential benefits which improved communications would make available to each business were grouped into two main categories:

- Export effects (improved operational efficiency, sales prices, sales expansion and savings in manpower/management time);
- Import effects (improved purchase prices, inventory levels, savings in transport costs).

The study demonstrates the extent to which the foreign exchange benefits of telecommunications investment exceed the foreign capital costs. It was estimated that the firms would be able to increase their current export earnings by an average of 0.74% yearly, through expansion of export markets and improved terms of trade, if telecommunications facilities were improved as detailed for each individual firm. The export-oriented businesses estimated that savings in staff time could result in an average 0.03% increase in export earnings. On the side of the import effects, due to improved efficiency, the average savings to the businesses interviewed was 0.07% of their import bill, a much smaller effect than that on export earnings. Only in the case of the petroleum company could the total cost of imports have been reduced substantially (by almost 1%, but this has not been included in the aggregated analysis because the situation is atypical). Taking the export and import gains as a result of improved telecommunications together, the companies (not including petroleum imports) could improve foreign exchange positions by 0.75% of total export earnings.

#### Box 4

##### Enhancing Export Earnings Potential in Different Sectors

The Kenya study found that all three sectors that formed the focus of the study – agriculture, industry and services – were shown to benefit substantially.

- **Agriculture:** The ten agricultural businesses could increase foreign exchange earnings by an average of 0.66% above current export levels, mainly as a result of better communications with their own estates and freight forwarders (avoiding processing and distribution losses), and as a result of better contact with buyers and improved price information in very volatile markets. For non-traditional products such as flowers, vegetables and nuts, price information and the perishability of stocks proved to be extremely important. Opportunities for agricultural companies to reduce their import costs through improved communications were found to be minimal.
- **Industrial:** The six manufacturing companies could increase export earnings by 1.1% of current exports. Other African countries generally offered the best markets for export expansion, but opportunities are limited by the quality of the telecommunications service within the continent. Import requirements could have been reduced by 0.62% for the group as a whole, with processors of raw materials (such as petroleum) in a position to reduce their import bill by 1%.
- **Services:** The tourism and travel sector, which is almost exclusively foreign exchange-oriented, is particularly susceptible to inadequacies in the domestic telecommunications network. It was found that businesses could increase earnings by 0.75% given better service quality and telecommunications links to remote tourist areas. The opportunities for reducing import bills, however, were found to be negligible.

In addition to increased levels of export earnings and reductions in actual import levels, the study identified indirect benefits on the country's foreign exchange position. The case study sample included five companies producing for the domestic market in order to displace essential imports. The net foreign exchange "contribution" as a result of local processing by these businesses is equivalent to 25% of the value of total output. It was estimated that the "indirect" foreign exchange benefits to these five companies were equivalent to over 2% of their total foreign exchange contribution.

### 5.3 Impact on the performance of business: Kenya

The impact of telecommunications on the performance of a sample of nine business enterprises in Kenya was investigated in 1981 (see Note). The firms were engaged in manufacturing/processing; services or transport; and agriculture or horticulture. Within these three categories, the study documented telecommunications benefits relating to business expansion, sales price and purchase price effects, vehicle use, production stoppages, distribution costs, labour time, and managerial time.

NOTE – The Impact of Telecommunications on the Performance of a Sample of Business Enterprises in Kenya: A Research Report to the International Telecommunications Union, CSP International, ITU, August 1981.

Among the estimated average increments in the percentage of profits to revenues – for all the forms of benefit mentioned that would occur in the case of an improvement of the national telecommunications system – the single most important potential benefit to the nine firms would be an increase in sales made possible by better access to markets for buying and selling. The study concluded that net savings ranging from 1.2% to 9.2% of total revenues could be obtained by the nine firms if they had access to improved telecommunications services. The average saving was about 5% of gross revenues:

Benefit category	Estimated average percent increase in profits to revenues
Business expansion	2.8
Sales price effects	0.4
Purchase price effects	0.2
Inventory costs	0.0
Vehicle use	0.1
Production stoppages	0.0
Distribution costs	0.3
Labour time	0.9
Managerial time	0.3
<b>Mean average for the nine firms</b>	<b>5.1</b>

The estimated benefits to the firms if telecommunications services were available throughout Kenya were as follows:

Firm	Estimated total benefits (KSh) (see Note)	Estimated total Telecom cost (KSh)	Benefit/cost ratio
East Africa Industries	11,930,000	125,460	95.1
House of Manji	4,417,900	14,760	299.3
Alliance Hotels	870,000	13,480	64.5
Industrial Distributors	2,390,000	17,080	139.9
Interfreight	5,565,000	57,900	96.1
Pan african Travel	275,400	2,320	118.7
Standard Newspaper	6,035,600	31,060	194.3
Kenya Horticultural Export	2,627,500	31,460	83.5
Kenya Nurseries Corporation	27,400	2,560	10.7
<b>Total or Average</b>	<b>34,138,800</b>	<b>296,080</b>	<b>115.3</b>

NOTE – Only those benefits greater than 0.05% of revenue are included.

The study concluded that telephone calls made by employees of these nine Kenyan firms were on average worth over ten times the cost. The consumer surplus for firms located in rural areas would be even greater because of the higher costs associated with alternative means of communications and therefore the greater likelihood that business expansion and other effects would be realised. On average just over 25% of the benefits would be in direct cost reductions for travel and labour/management time. It could be assumed that some of the purchase and sales price effects may also be available as immediate benefits, thus up to 30% of the total benefits may be classed as direct or immediate. Assuming the study's estimates of the telecommunications service costs are not seriously underestimated, the resulting benefit/cost relationship should perhaps be assumed to be 25-30% of the ratios reported here, thus ranging from 3:1 to 90:1 with an average of around 30:1.

## 5.4 Economic Impact of Improved Telecommunications in Philippines

The value of improved telecommunications to enterprises was the focus of an exhaustive study conducted in the Philippines in 1984 (see Note), in the regions of Northern Luzon and Northern Mindanao. The methodology utilized in the study has the scope for application to other countries and contexts. Important features of the study are: a relatively large sample size; careful analysis of possible external benefits and conservative reporting to avoid exaggeration; deriving cost figures for calculating the benefit/cost ratio from the tariffs for private usage as well as the cost of providing the service; formulation of the final results to explain benefit/cost ratios for telephone owners, and determination of the percentage of mainlines sufficient enough to generate enough external benefits to justify the costs of the network's operation.

NOTE – A Microeconomic Study of the Benefits of Improved Telephone Service in Selected Areas of the Philippines: A Report Submitted to the Ministry of Transportation and Communications of the Republic of the Philippines, CSP International, February 1984; The Economic Benefits of Improved Telephone Service in the Philippines, in Information, Telecommunications and Development, ITU, 1986.

In-depth interviews were conducted with the managers of 252 businesses, which were grouped into three different categories: the agricultural (production, manufacturing and trade), health, and other activities, which included general manufacturing, construction, wholesale and retail trade, and financial or other services. The methodology of the survey focused on describing the nature and size of each agency's business, the actual plans and expectations for expansion and enhancement as better telecommunications facilities became available, and the likelihood that expected benefits would be realised.

The proportion of interviewed establishments which were judged to be able to derive benefits equal to or greater than the estimated cost of the tariffed service was approximately 53%. Those for whom the benefits would be below cost were generally the smallest establishments and it was assumed that they would not choose to subscribe. Hence, the composite benefits were generated from the 53% who were assumed to become subscribers. The average benefit/cost relationship for the 53% was 24.9 (i.e. benefits were approximately 25 times cost), summarised as follows:

Sectoral group	No. in sample	Proportion with benefits	Benefit/cost factor
<i>Northern Luzon</i>			
Agriculture	47	47%	35.7
Health	27	41%	6.4
Other businesses	63	75%	12.1
Total	137		
<i>Northern Mindanao</i>			
Agriculture	44	39%	56.3
Health	20	50%	63.1
Other business	51	53%	12.1
Total	115		

The agriculture division included primary producers of agriculture products, forestry and fishing, as well as food manufacturers, saw mills, farm traders, supply distributors and commodity exporters. The following table indicates that the manufacturing and trade organisations expected to derive much higher benefit/cost relationships than primary producers.

Agriculture division	No. in sample	Proportion with benefits	Benefit/cost factor
Agriculture, forestry & fishing	40	28%	18.0
Agricultural manufacturing	23	57%	69.0
Agricultural trading	27	52%	40.8
Total – Northern Luzon	47	47%	35.7
– Northern Mindanao	44	39%	56.3

The health sector respondents included public health-care services (including hospitals), private clinics and hospitals, and pharmacies and other distributors of health-care products. The results are summarized in the following table. In addition to the normal “business benefits” of time and travel cost savings, administrative efficiency, etc., there was great enthusiasm amongst respondents for the potential impact on the health-care system generally – such as better response to patient needs, more efficient specialist consultations, better organized referral system and allocation of patients between local and regional hospital (reducing crowding at the top by patients not prepared to trust the system), reduction of wasted patient visits, etc. These benefits were much more difficult to quantify in the public health-care sector, where the system has adapted to the constraints of poor communication, than in the private sector where greater efficiency more quickly translates into more patient visits, doctors’ fees, etc. The large disparity between the benefits in Luzon and Mindanao is largely due to this factor.

Health sector division	Number in sample	Proportion with benefit	Benefit/cost factor
Public & private health-care delivery	42	38%	35.5
Distribution of health-care products	5	100%	26.7
Total – Northern Luzon	27	41%	6.4
– Northern Mindanao	20	50%	63.1

The “other activities” division exhibited a wide range of benefit/cost relationships, as shown below, perhaps partly as a result of the less representative sample size in some sectors. With the exception of the construction trade, which was represented by just two interviews, the results generally indicate a higher benefit/cost relationship for the transport, financial and other service industries, than for manufacturing.

Other sectors	Number in sample	Proportion with benefits	Benefit/cost factor
Manufacturing	54	57%	10.5
Construction	2	100%	39.4
Wholesale/retail trade	20	80%	7.4
Transportation	6	83%	31.6
Financial services	5	60%	21.1
Other services	7	43%	13.6
Total – Northern Luzon	63	75%	12.1
– Northern Mindanao	51	53%	12.1

**Variations due to current experience with telecommunications:** The survey found a strong correlation between organisations’ current use and knowledge of telecommunications and their predicted benefit level. Generally, those organisations large enough to have been able to afford the phone or to secure service for some time have begun to restructure and improve their operations to make greater use of the available communications efficiencies. They also perceive greater impacts from improved service. The differences due to current experience with telecommunication service were as follows:

Organisations with...	Proportion with benefits	Average benefit/cost factor
no telephone service	54%	15.4
defective service	75%	30.6
local exchange only	54%	30.5
local + long distance	41%	57.3
a private radio system	43%	31.9

**Variation due to size of organisation:** There was also a very clear correlation with size of organisation, as reflected in the number of employees, up to the point (above 100) where the nature of the business activity and internal structure probably have more influence on the benefits derived than do size.

No. of employees	Proportion with benefits	Average benefit/cost factor
1-4	22%	2.5
5-9	60%	6.8
10-19	65%	21.0
20-49	67%	25.6
50-99	59%	79.5
100-199	38%	73.2
200-499	33%	59.1

The results showed that, on a per business lines basis, the annualized cost/benefit ratios were calculated as 13.5 for Northern Luzon and 20.1 for Northern Mindanao. On a total project basis, assuming no benefit from residential lines, the benefit/cost ratios were 1.0 and 1.2 respectively. This implied that the aggregate socio-economic benefit from just the business lines – even if they were well less than 10% of the total number of subscriber lines – would exceed the costs of the entire systems. Thus the incremental benefits gained from the balance of the subscribers would have increased the project's total economic return substantially.

## 5.5 The Benefits of Rural Telecommunications: Costa Rica

A study carried out in Costa Rica in 1976 (see Note) tried to determine the transport and time costs to reach a rural telephone. Information was assembled on the price paid for each call, the caller's income, travel time to the telephone, reason for the trip, transport cost, and hours worked during the week. The consumer surplus per call was arrived at by adding the calculated average transport cost per call and the opportunity cost of time. Due to different user profiles (the time people have to travel to the phone, the monthly income of the caller and the number of hours worked each week), two sets of assumptions were used to estimate transport cost and time value. The fair average between the high and the low estimate is the arithmetic mean that gives us a ratio of consumer surplus per call to average call charge of 2.65, which means that the caller could save 2.65 times the average call charge by having and using his or her own telephone. Including a personal benefit of twenty per cent, the ratio would amount to already about 3.2.

NOTE – Saunders *et al.*, Telecommunications and Economic Development, World Bank/The Johns Hopkins University Press, 1994.

Another study done in Costa Rica in 1975 (see Note) estimated price elasticity for an increase in call charges. For this estimation, data for public telephones obtained from extended periods of traffic observation before and after the price change from 12 to 15 centimos on January 1st were used. The price increase had caused changes that indicated a price elasticity of about -0.5 and showed that revenue under-represented total benefits by almost 22%.

NOTE – Saunders *et al.*, Telecommunications and Economic Development, 1994, *op. cit.*

Two studies have been carried out in Costa Rica in 1975 and 1986 (see Note) to evaluate the impact of the telecommunication services in the social and economic development of the country. The objective of the first study was to determine the benefit of telecommunications to the rural communities, whereas the second study tried to determine the benefit of telecommunication services in the urban and suburban areas. Both studies show that telecommunications are a very important factor in the social and economic development of the country. The benefit/cost ratios obtained from telecommunications investments vary from 5:1 for residential subscribers to 50:1 for commercial subscribers. These ratios are difficult to reach by any other sector of the Costa Rican economy.

NOTE – The Socio-economic Impact of Telecommunications in Costa Rica, Instituto Costarricense de Electricidad (ICE), October 1987.

**Box 5****Economic Benefits to Rural Users**

Some of the conclusions of the Costa Rica study were:

- On an average, a rural telephone user is willing to pay up to 5 times the actual cost of a telephone call if a public telephone existed in his community, due to the savings obtained in time and transportation costs.
- This benefit, known as the “consumer surplus”, is higher when the income level of the user is lower.
- Consumer surplus was higher for emergency-health and productive-public calls and lower for calls concerning family or labour affairs, as is indicated in the following chart:

Type of call	Consumer Surplus/Cost of Service
Emergency/Health	11.2-23.6
Productive/Public/Social	6.4-8.1
Family Labour	1.6-2.8

- There has been a considerable increase in the use of rural public telephones for business-related calls (from 16.7% in 1975 to 33.05 in 1985).

From the study undertaken in 1986 in urban and suburban areas of the central valley, the following conclusions can be drawn:

- On an average, the ratio of economic benefits to the associated costs of providing the service varies from 5:1 in the case of residential subscribers to 50:1 in the case of the typical commercial category subscribers. For larger enterprises and for those dedicated to export activities, this ratio was found to be in the order of 30:1.
- From the point of view of individual enterprises (a microeconomic approach considering the benefits obtained by the enterprise and the cost of the telecommunications services to the enterprise), this ratio varies from 12:1 to 25:1, which indicates the substantial benefits obtained from an adequate use of telecommunications services.
- From the point of view of the Costa Rican society, the benefit/cost ratio is up to 3 times greater than for individual enterprises and residential subscribers.
- Both residential and commercial potential subscribers underestimated the benefits they would derive from the telephone service. In general, this underestimation was in the order of 30% compared to subscribers of recent connection, and about one half compared to those having used the service for more than 4 years. These results confirm that the benefits of telecommunications services increase as the time passes and to the extent that the subscribers discover new applications and become accustomed to the service.

## 5.6 The Benefits of Public Telephones: Senegal

A study was undertaken in Senegal in 1986 (see Note) to quantify the user benefits from public telephones. In this study, approximately 700 users of public telecommunications facilities were asked in interviews to provide information to draw up a user profile so that a value for the consumer surplus could be calculated, the consumer surplus being the direct benefit derived from using telecommunications as opposed to an alternative form of communication. The data included age, level of education, occupation, the purpose of the call, the travel distance for the purpose of communication and the preferred alternative method of communication, if the call attempt had failed. Apart from that, telephone users were also asked some questions to find out how much they would be willing to pay for a better quality service or to have a public phone available closer to their home.

NOTE – Christopher W. Nordlinger, Users of Public Telephones and their Benefits in a Developing Country: A Case Study of Senegal, in ITU, Information, Telecommunication and Development, 1986.

The Senegal study also took into consideration that it is difficult to value the opportunity cost of time in a rural setting, which is subject to seasonal variation and informality, and where some travel may serve multiple purposes. These problems were taken into account by not counting any travel which was multi-purposed and by always choosing the lower of any opportunity cost alternatives. The study used an average value for the cost of a 4.3 minute call irrespective of distance, and calculated a total economic price, which is the average user benefit per call, by valuing the cost of the



best alternative. The methodology of not considering the distance introduces an underestimate of the consumer surplus for shorter distance calls and an overestimate for longer distances, but on average it would yield consumer surpluses of between 38% and 134% or – to put it differently – benefit/cost factors ranging from 1.38 to 2.34. The economic revenue stream (i.e. the cost of the best alternative) would range from 2.0 to 3.0 times the financial revenues.

## 5.7 Rural Public Telephones: Vanuatu

The ITU conducted a study in Vanuatu in 1988 with the objective of optimizing the placement of rural PCO telephones (see Note). In spite of a good telecommunications infrastructure for urban areas and big businesses in the rural areas, the rural population did not have easy access to telephones. Only about 60 rural telephones (44 of which were public) served about 80% of the total population of 130 000. The study was undertaken to determine the extent and optimal spatial layout that would yield the highest benefits to the rural users of public telephones for a given cost. The study measured and modelled the losses resulting from the lack of adequate telecommunications.

NOTE – ITU, Socio-economic Benefits of Improved Telecommunications in Developing Countries: Results of a Research Study in Vanuatu, August 1988.

Data was collected on the round-trip distance travelled (either on foot or by vehicle) to all existing public phones in rural areas. Demand for domestic calls per 100 inhabitants a year was then expressed as a function of the cost incurred by the individual callers, based on the minimum subsistence wage and the cost of paid transportation by vehicle. The valuation of travel distance was determined to be Vt 30 per kilometre, which was, in turn, used to calculate consumer surplus. A spatial model was then developed to determine the benefit of extending the rural network by reducing the distance rural dwellers had to travel to reach a telephone. The country was divided into ninety-six zones, and the model was used to compute the call rate per 100 inhabitants, volume of telephone traffic, distance to the nearest telephone, zone in which the nearest telephone was located, and consumer surplus for each zone and for the entire study area in aggregate.

Expanding the number of telephone locations from forty-four to sixty-four was calculated to yield an incremental benefit of Vt 2.6 million a year (56 000 kilometres of travel saved a year); if 100 zones received a phone, the incremental benefit would be Vt 11.4 million a year (125 000 kilometres saved a year). The average annual benefit realized per location from the addition of ten locations (increasing the number of telephones from 44 to 54) was Vt 94,100 and from the second addition of ten locations (from 44 to 64) was Vt 78,200. Overall, the economic benefits gained from the telephone network increased as the number of locations increased, but at a decreasing rate; most of the benefit was obtained in the first 100 locations; as it increased, the traffic tended to include more lesser-valued calls. One serious limitation of the study was that the benefits were not evaluated net of costs, since relevant information was not available on the costs of providing service. Thus, it is not known whether the recommended strategy was on a cost recovery basis.

The table below shows the effect of installing more telephones to reduce the distance to the nearest telephone. On the one hand, the result is an increase in calling rates, on the other hand, the incremental benefit of having 200 telephones is 3.7 million Vt/year, and with 500 telephones is 7.0 million Vt/year.

Number of telephones	Distance from the nearest telephone		
	3 km	5 km	8 km
Current situation	3 km	5 km	8 km
With 200 telephones	1 km	3 km	5 km
With 500 telephones	1 km	1 km	3 km

It was observed that benefits accrue to each market segment as new rural locations are served by publicly accessible telephones. The annual rural benefits by market segment (millions Vt/year) are summarized in the following table.

Market segment	Annual rural benefits (millions Vt/year)		
	200	300	500
Domestic	7.4	9.7	11.5
Government Services	7.7	8.8	11.0
Business & Agriculture	2.9	2.9	2.9
<b>Total</b>	<b>18.0</b>	<b>21.4</b>	<b>25.4</b>

## 5.8 Rural PCOs: Andhra Pradesh, India

In the Andhra Pradesh State in India in 1981 (see Note), a survey among users of village public telephones found that slightly more than two thirds of them regarded their most recent PCO telephone call to have been so important that they would have travelled to the destination of the call if a public telephone had not been available. Hence, the cost that would have been incurred by each caller to travel to the call destination rather than make the telephone call was estimated. Travel cost was taken as the fare for the cheapest means of travel – by bus. The value of the time lost by making the journey was conservatively estimated by using the prevailing wage rate for unskilled labour. For the 120 PCO users who judged that their most recent call was urgent enough to warrant travel in the absence of the telephone, the estimated benefit/cost ratio ranged from 2.5 to 5.6.

NOTE – India's Rural Telephone Network, ITU, 1981.

## 5.9 Estimating Consumer Surplus: Thailand

A study was conducted in rural Thailand in 1980 (see Note), with the objective of estimating consumer surplus. A survey established usage patterns, including length, frequency and purpose of call, distance travelled to make the call. Users were also asked to estimate the financial benefits received from making a call, and to choose their next best alternative. The result of benefits derived by non-subscribers provided two means of valuing the user's benefit/cost relationship or consumer surplus.

NOTE – Social and Economic Impact of Rural Telephones in Thailand, Telephone Organisation of Thailand and East-West Center, 1980.

Type of call	TOTAL call charge (Baht)	Full cost including travel to phone	Average user-estimated benefit	Consumer surplus	Benefit/cost factor	Benefit/cost factor by best alternative
Neighbourhood phone	14.51	18.76	186.65	166.89	9.9	4.0
Non-neighbourhood	22.51	50.10	242.30	192.20	4.8	2.2
Radio PCO	16.18	23.58	227.03	203.45	6.8	4.4-7.8

The following table summarises the two different levels of consumer surplus which were calculated from the survey, taking the example of the out-of-neighbourhood phone:

Total call benefits estimated by users	(D-B)/B = 4.84 (Consumer surplus = 384%)	D	242.30
Cost of alternative	(C-B)/B = 2.25 (Consumer surplus = 125%)	C	112.74
Total expenditure	(Demonstrated willingness to pay)	B	50.10
Price paid for call		A	22.51

The benefit/cost relationships by type of call were as follows:

private sector business/commercial	11.94
private family affairs	9.11
office business matters	6.48

**Office and residential lines:** The overall benefit/cost estimates for office telephone users, using the best alternative method, were similar to those for neighbourhood and PCO telephones, while those for residential subscribers, though still significant, were lower. They are summarized below:

Office lines	3.49	assuming one user per line
	4.45	assuming five users per line
Residential lines	2.69	assuming one user per line
	3.04	assuming three users per line

**Regional, income level and sectoral variation:** A summary of the average benefit/cost factors (by the next best alternative method) according to proximity to Bangkok and income level is shown below:

	Low distance	Medium distance	High distance	Income level 1	Income level 2	Income level 3	Income level 4
Neighbourhood phone	7.4	3.7	3.8	7.0	6.5	3.6	2.9
Non-neighbourhood	2.7	2.3	2.5	1.5	3.2	2.5	2.4
Office (five users)	6.7	4.1	3.1	7.0	4.3	4.1	3.0
Residence (three users)	5.6	2.9	2.1	5.6	3.0	2.9	2.3

A final and very significant result from the radio PCO user sample was that farmers derived the highest consumer surplus per call (Baht 298), even though they did not use the phone as often as other occupational groups. The corresponding figures were Baht 255 for businessmen and Baht 192 for government staff.

## 5.10 Rural Telecommunications: Indonesia and Thailand

The need for telecommunications in rural areas was considered in two studies conducted in Indonesia and Thailand in 1982 (see Note). Using the findings from questionnaire surveys, the authors examined how the telephone is used when limited facilities are available, the effects of telephone service in terms of improved communication and work efficiency, and the consequences of not having access to a telephone.

NOTE – Godwin C. Chu, Chote Srivisal, Alfian, and Boonlert Supadhiloke, Rural Telephone Service in Indonesia and Thailand. Social and Economic Benefits, *Telecommunications Policy*, June 1985. For details see: Alfian, Godwin C. Chu and Maswadi Raud, Social and Economic Impact of Rural Telephone in Indonesia, East-West Center, Honolulu, Hawaii, and LRKN/LIPI, Jakarta, January 1984; and Boonlert Supadhiloke, Godwin C. Chu and Chote Srivisal, Pilot Study of Social and Economic Impact of Rural Telephone in Thailand, East-West Center, Honolulu, Hawaii, and Thammasat University, Bangkok, November 1983.

The study in Indonesia focused on three rural subdistricts (kacamatan) which were chosen in the vicinity of Bandung. These were: Majalaya, a booming rural town with 555 telephones; Pangalengan, a rural town with 58 telephones; and Soreang, a typical rural area having only two telephones. From each subdistrict, two villages (desa) were chosen.

A combination of purposive and random sampling was used to select 299 respondents in four categories: subscribers who had a telephone in their homes, which in many cases were the sites of their businesses; workers in offices where a telephone was available; telephone borrowers, who had no telephone but were known to borrow other people's telephones fairly regularly, and non-subscribers with no ready access to a telephone. The sample was fairly evenly distributed concerning sex, age, education and other criteria.

**Box 6****The Demand for Rural Telecommunications**

The study in Indonesia found that there was a pressing need among people in rural areas to communicate beyond their immediate environment. Among the sample of non-subscribers, nearly 40% needed to communicate with people outside their work places regularly. The corresponding percentages were much higher among home telephone subscribers (79%), office workers (80%) and telephone borrowers (76%).

Development programmes in rural Indonesia require close communication between offices and organizations. The importance of the telephone for this kind of communication is suggested by the following finding: of the home telephone subscribers, 76% used the telephone for communicating with offices and organizations, compared with 52% of office workers, and 23% borrowers. Among the non-subscribers, nobody mentioned using the telephone for this kind of communication. On the other hand, 78% of non-subscribers relied on personal visits, compared with 61% of borrowers, and 42% of office workers. Only 10% of home telephone subscribers used personal visiting for such purposes.

Concerning alternative means of communication, more than half of the Indonesian respondents took the option of borrowing someone else's telephone, reconfirming the importance of the telephones in their lives. Most respondents felt that the telephone had influenced their lives, more so among the home telephone subscribers (96%) than among office workers (69%) and borrowers (47%). For most respondents, the influence was seen in terms of facilitating various kinds of relationships, rather than merely transmitting information or saving time. It seems that interpersonal relations are of primary importance to work and business in these Indonesian rural communities. As work relations expand in the course of economic development, the telephone becomes an indispensable means of maintaining those relations that are essential to job performance.

The Thailand study focused on four districts, two semi-rural and two rural, all of them within a distance of not more than 900 km of Bangkok. The semi-rural districts were: Phuket with 1 400 telephones and Kamphaeng Phet with 400 telephones. The two rural districts were Pasang with 100 telephones and Choke-chai with no telephones at the time of the study.

Again, a combination of purposive and random sampling was used to select 400 respondents in four categories: home telephone subscribers, who had a telephone in their homes, which were usually the sites of their businesses; workers in offices where a telephone was available; people who had two telephones, one in their home and one in their office; non-subscribers with no ready access to a telephone. The sample was fairly representatively distributed concerning sex, age, education and other criteria.

**Box 7****The Demand for Rural Telecommunications**

The findings of the Thailand study were similar to that of the Indonesian study: the Thai respondents felt a strong need beyond their immediate environment. Among non-subscribers, 85% needed to communicate with people outside their work-place regularly. This figure was much higher than in Indonesia, perhaps partly because of the inclusion of two semi-rural areas in the Thai sample. In the other Thai groups, the percentages were: 96% among office workers, 93% among home telephone subscribers and 98% among those with two telephones.

The need to communicate with offices and organizations was just as pressing as in Indonesia: 77% non-subscribers, 91% office workers, 89% home telephone subscribers and 95% among those having two telephones.

This study indicated that there is a nascent demand even in rural areas for telecommunication services in countries such as Indonesia and Thailand. Where the telephone is available, either from private business or government offices or individual homes, the limited facility is fully utilized. Roughly three-quarters of the surveyed calls were long distance. If more public telephones are installed in rural areas, the findings suggest that they will be used to the fullest extent and will produce revenues, mostly from long distance calls.

For many of the rural residents surveyed, the lack of telephone services appears to be a major handicap. In the Thai sample, nearly 65% of those who did not have a telephone in their neighbourhood had to travel more than 25 km to get to a telephone. Nearly 10% had to travel more than 40 km. More than 90% of such calls were long distance.

## 5.11 Cost-Benefit of Rural Telephones: Thailand

In Thailand, in 1983 only one quarter of the available lines were located outside metropolitan Bangkok; the telephone density was 6.99 in the metropolitan area, but only 0.40 in the provincial areas. The Telephone Organization of Thailand (TOT) conducted a cost-benefit analysis of rural telephones in Thailand in 1984-1985 (see Note) in cooperation with the East-West Center in Honolulu, Hawaii, as a guide for investment in telecommunications, for which 12 provinces were chosen as research sites. The conclusions of this study were as follows.

NOTE – Godwin C. Chu, Cost-Benefit Analysis as a Guide for Investment in Telecommunications: A Study in Rural Thailand East-West Center, Honolulu, Hawaii; Chote Srivisal, TOT, Bangkok, 1985.

### Box 8

#### Cost-benefit analysis of Rural Telephones in Thailand

Some of the principal conclusions of the study were as follows:

- A telephone in the office can improve work efficiency by as much as eight times. Regardless of types of facilities, whether they are in the office, or even in another community, these telephones are fully utilized and generate sizeable benefits to the users as high as ten times cost.
- The benefit/cost ratio (using the self-estimate approach) for the neighbourhood and radio telephones are twice as high as the ratio for the non-neighbourhood telephone from the consumer's viewpoint. The cost of using the neighbourhood and radio telephones is less than half the cost of using non-neighbourhood telephones. The main difference was in travel. With a neighbourhood telephone and a radio telephone instead of a non-neighbourhood telephone, travel cost was reduced from Baht 23.59 to Baht 3.25 and Baht 6.40, and travel time was cut from 35 minutes to about 7 minutes and 9 minutes respectively.
- Overall, the economic analysis indicates a wide range of personal benefits/savings that accrue to telephone users from not having to use more expensive communication alternatives. Using the best-alternative method, the benefit/cost estimates range from a low of 2.25 for non-neighbourhood telephone users to a high of 7.80 for the frequent users of public call offices. The benefit/cost ratio is somewhat low for home subscribers (2.69 assuming one user per line and 3.04 assuming three users), but it increases to about 4 for office subscribers, neighbourhood telephone users, and less frequent PCO users. The closer the nearest available telephone is to the users, the higher will be the ratio of benefits to costs.
- Using the best-alternative method, the mean benefit/cost ratios were examined according to their order for the twelve provinces when they are grouped into three categories of distance from Bangkok (low, medium and high). The provinces that are close to Bangkok consistently have the highest mean benefit/cost ratio. The mean benefit/cost ratio for the close provinces is highest for the neighbourhood telephone (7.39), for the non-neighbourhood telephone (2.67), for the office telephone (6.66), and for the home telephone (5.55). The important difference is between the low distance group and the medium/high groups. The findings support the conclusion that closer a province is to Bangkok, the more likely are telephone users in that province to obtain a relatively high benefit per unit of cost.

The results of this study have been further confirmed by another study undertaken in Thailand in 1996, which focused on the Rural Long Distance Telephone Project undertaken by the Telephone Organization of Thailand (TOT) under the universal service obligations, to provide rural telecommunications through both public and private connections. The project met broader criteria of socio-economic objectives – promised to provide high consumer surplus and stimulate economic activities.

In 1996, MIDAS Agroecconomics Co. Limited conducted a study of the socio-economic impact of rural telecommunications (see Note). Information was collected from three groups of people such as telephone users, public call office operators and members of the public: village leaders, farmers, poor people, business people, teachers and students. The study was conducted in nine provinces to meet the criteria of geographic distribution, incidence of poverty and remoteness of the area. Within each province, three villages were selected for the study, one with a recently installed telephone, one with a longer history of telephone usage, and one without a telephone.

NOTE – Study Group 1, Question 1/1, Contribution by Thailand.

The study found that the public telephones installed under this project provided substantial benefits to the people in rural areas: poorer members of the community could learn about the availability of jobs and keep in contact with family members living in distance places. Telephones contributed to better informed decisions about migration. Farmers and

traders could check on prices and increase their incomes. Telephones assisted public and private agencies in delivering services to rural people, including the benefits of rapid reporting of accidents and other emergencies. The economic value of saving in travel and other communication costs meant that benefits were worth at least twice the amount spent on a telephone call. The findings of the study helped to make informed decisions on further expansion of the rural telecommunication network.

## 6 Conclusions

The following table presents a summary of the results of some comparable studies of economic benefit/cost ratios associated with telecommunications infrastructure investments.

Author	User groups studied	Type of investment	Typical benefit/cost ratios obtained
CSP International: 1981	Kenya: Urban business	Telephone network	10:1 to 100:1
MIT Program on Communications Policy/ University of Cairo: 1981	Egypt: Villages	Telephone network	50:1 to 100:1
CSP International: 1983	Philippines	Telephone network	20:1 to 25:1
India's Rural Telephone Network, (ITU) 1981	Andhra Pradesh, India	Rural PCOs	2:1
CW Nordlinger, 1984	Senegal	Rural PCOs	2:1
Midas Agroecconomics, 1996	Thailand	Rural PCOs	2:1

The discussion above shows that results of the studies based on different approaches are similar in their order of magnitude. The results are summarized as follows:

- The studies reviewed in this part of the report indicate a positive relationship between economic development and telecommunications. Investment in telecommunications not only contributes to cost savings, increases income, and enhances general business efficiency but also increases the impact of other infrastructure investments. Telecommunication is an indispensable tool for an economy which tries to develop from an agrarian subsistence economy.
- A review of a number of case studies indicates a fairly uniform view of the order of magnitude of the benefits in the context of specific conditions under which they are derived. Several studies conclude that the economic benefits of telecommunications (over and above their cost) are about one dollar per call in rural areas of developing countries or a few per cent of the revenues of companies. Overall, the consumer surplus (above the cost to the consumer) is about as much as the tariffs paid.
- The impact of telecommunications is more pronounced in rural and remote areas. The more remote a region is, the more important is the contribution of one telephone towards the GNP. The economic impacts of telecommunications, however do not become apparent immediately. They can be measured only after some time lag.
- A broad generalization could be drawn from a number of case studies, that the pattern of income distribution is a crucial determinant of ownership of telephones. However, once available, telecommunications are valued by every strata of population.
- Developing countries need access to world markets for their products and services. Access to world markets is synonymous with access to the telecommunication networks and services. The development of adequate telecommunication facilities can contribute significantly to the developing countries' export promotion and diversification efforts which, in turn, are central for economic growth. It is thus an important element of restructuring the economies of these countries.

## 7 An agenda for future studies

Most of the studies on the role of telecommunications in economic development, particularly microeconomic case studies, have been conducted during the 1970s and 1980s. As discussion of a sample of case studies shows, there is consensus on the order of magnitude of the positive impact of telecommunications. However, the current context is shaped by technological change and regulatory innovations of different magnitude, particularly relating to the development of Internet and the emergence of interactive services. The integration of information and communication technologies is being felt in every area – in commercial transactions and services, in manufacturing processes, in communication and breakthroughs offered in the ability to organize, integrate and create access to information from a multiplicity of sources. In this context, studies focusing on simple telephony have limited relevance.

There is thus a need to focus on the impact of telecommunication and information technologies on economic development, particularly on sectors such as agriculture, tourism, health, industry, environment, etc., with case studies conducted in developing countries. The studies conducted in several countries would be particularly useful if they were based on widely applicable methodology for determining the impact of telecommunications and information technology. A uniform methodology would make the results derived comparable, bearing in mind the different circumstances of different countries.

A study of this nature could particularly benefit from some of the on-going BDT's technical cooperation activities and several of the BAAP Programmes.

For example, the objective of the Integrated Rural Development Programme is, *inter alia*, to test the viability of different institutional arrangements and technical solutions, demonstrate sustainability of the Multi-purpose Community Telecentres (MCTs) (see Note 1) and associated rural networks and evaluate the impact of providing access to modern information and communication technologies to people in rural and remote areas through pilot projects. This programme aims to develop appropriate models and guidelines for policies, financing strategies, tariff structures and service delivery. These pilot projects are to serve as a test bed for applications and services to meet the needs of rural communities. At the same time they offer a unique opportunity of measuring and evaluating the economic, social and cultural impact of telecommunications on the communities. Over a period of time, such evaluation would no doubt generate quantitative data comparable across countries (see Note 2). Other projects dealing with specific telecommunication and information technology applications in the area of health, environment and education would also be ideal candidates for generating concrete evidence of their impact.

NOTE 1 – The concept of Multipurpose Community Telecentres (MCTs) – (also known as Community Teleservice Centres, Community Information Centres, Electronic cottages, “Telekiosks” or Public Call Office (PCO) as a shared information and communication service facility – is today widely recognized, as means of improving access to such services in rural and isolated areas (as well as in deprived urban areas). Such centres would provide Information Technology (IT), and telecommunication facilities, user support and training for the majority of the population of a rural community who cannot afford such facilities on an individual basis and/or do not have the skills to use such tools. In addition to public telephone, fax and voice mail services, fully fledged MCTs would provide access to data networks (e.g. Internet) for e-mail, file transfer, access to electronic libraries and databases, government and community information, systems, market and price information, environment watch, etc., as well as facilities and equipment for teletraining and telemedicine. As MCTs would be equipped with computers, printers, photocopiers, etc., they could also offer (shared) office facilities and support for local small business and “teleworkers”. Moreover, they may provide facilities, equipment and training for local production (and reception) of community radio and TV broadcasting programmes.

NOTE 2 – The first pilot project within this programme was implemented in Suriname in 1996 and pilot projects in Bhutan and in Vietnam are about to be started.

## PART II

### **The role of telecommunications in promoting social and cultural cohesion**

## **1 Summary of principal conclusions**

### **1.1 Telecommunication and social and cultural cohesion**

The main conclusions of the present part of the report can be summarized as follows:

- a) There is a close relationship between the availability of telecommunication services and structural change and economic development and growth. Rising prosperity is one of the principal factors helping moderate the negative social impact of competition and structural change. However, there is also a close relationship between the efficient functioning of the market economy, economic development and growth, on the one hand, and policies aimed at moderating these negative effects and strengthening social cohesion, on the other hand.
- b) The development of modern telecommunications plays an important positive role in maintaining and strengthening social and cultural cohesion not only in the advanced market economies, but also in the developing countries and in the process of transition towards the market economy and stable democracy in the former socialist countries.
- c) Development policies in general and telecommunications policies in particular, at the national and the international level, have to take more explicitly into account the social dimension of the access to modern telecommunications.
- d) There is an important division of roles between the government and the private sector in telecommunication. The following should be some of the principal objectives of government policies, in the perspective of the topic of the present paper: a) to increase the awareness of the importance of telecommunication services as a decisive factor in the success or failure of the development and transition process, b) to encourage user-oriented telecommunication development, rather than one that is primarily operator-oriented, c) to attempt not only catching-up, but also “leap-frogging” in telecommunications technology and services, d) to create appropriate conditions for the expansion of both basic and advanced telecommunication services, and finally, e) to seek the right balance between the requirements of assuring a long-term return on investments, and those of developing and maintaining a core element of universal service.
- e) It is necessary to undertake and to encourage more systematic research efforts and data collection on the social dimension of the opportunities and challenges resulting from the current world-wide “information and telecommunication revolution” since, so far, this issue has received relatively little attention in the ongoing vast and growing research and debate on the technological, the economic and the policy dimensions of the changing role of telecommunications.

## **2 Introduction**

### **2.1 Objectives and scope of the present paper**

The principal objective of this analysis was to explore the relationship between economic development and the transition towards the market economy and social and cultural cohesion in the context of the challenges and opportunities linked to the ongoing information and telecommunication revolution.

Today, there is a vast body of high-quality research and publications on the various and economic, technological and policy-related aspects of the telecommunication sector not only with respect to the advanced, but also in the developing and transition economies. The question, however, of what is the direct and indirect impact of the availability or absence of telecommunications infrastructure and services on “social and cultural cohesion” tends to receive less attention, both in academic and official analyses.

The economic history of the last fifty years shows a positive relationship between a) the efficient functioning of markets, liberal economic policies and freedom of initiative, b) economic growth and development, and c) last, but not least, a certain degree of social and cultural cohesion and policies aimed at maintaining such cohesion. In view of the growing importance of



information and of telecommunication in the modern economy and in modern society, on the one hand, and of the world-wide trend of liberalization and the strengthening of the market economy, it appears important to better understand the role of the third element of this equation, i.e. the role of social and cultural cohesion in this context.

The present section has two main objectives: a) to identify some of the main issues related to this important topic, and b) to prepare suggestions for further, more detailed research.

### **3 Economic growth, social cohesion and access to modern telecommunication services**

#### **3.1 The challenge of maintaining social and cultural cohesion**

Maintaining social, cultural and ultimately political cohesion are among key ongoing challenges for rich and poorer countries alike. This task cannot be accomplished once and for all. In today's rapidly changing world, no country is fully immune to threats to social cohesion, threats of external or domestic origin.

Dealing with this challenge is a particularly complex task for countries faced with problems of economic and social development and those in the process of transition from centralized command economies towards the market economy based on individual freedom and initiative. In general, it is a major issue in the numerous multi-ethnic societies, where the traditional community ties, the shared cultural values and the feeling of solidarity are continuously being threatened by the centrifugal forces of ethnic nationalism, of rapid technological change and of excessive economic, social and regional inequality.

#### **3.2 Social cohesion is a dynamic phenomenon**

“*Social cohesion*”, within a local or regional community, or at the level of a nation, between groups and individuals, implies shared interests, cooperation and solidarity, a division of labour and tasks. Social cohesion, in traditional societies, but especially in the contemporary world, has to and can accommodate competition (a form of recognition of merit), as long as competition does not imply the lasting marginalization of large segments of society, and as long as there is individual and collective solidarity with the less successful. Social cohesion is not a static phenomenon: it also implies the ability of a large or small community to adapt to change, technological, economic, as well as social, without excessive tensions, without a breakdown.

#### **3.3 The true meaning of “cultural cohesion”**

What is the meaning, what is the role of “*cultural cohesion*”? While it is a more elusive concept than that of “social cohesion”, its importance is generally recognized by both politicians and academic writers. The term cultural cohesion can have both a positive and a highly negative meaning: 1) in a positive sense, it implies the ability of a given society to create the conditions for a dynamic balance between tradition and innovation, between the views, history, beliefs of a group or a nation and knowledge and information coming from the outside; 2) in a negative sense, cultural cohesion has been one of the most abused concepts in order to implement or to justify some of the most oppressive political systems known in this century.

Obviously, “cultural cohesion” imposed by terror, does not deserve to be called “cultural cohesion”, just as “social cohesion” imposed by political, physical or intellectual terror is not “social cohesion” in the true sense of the word.

#### **3.4 The relationship between economic development, economic growth and social and cultural cohesion**

Creating the conditions for sustained and sustainable growth has become not only a major economic goal, but also a social imperative both in the developing countries, and in the former socialist countries in transition towards the market economy.

There is a dynamic interaction between economic development and social and cultural cohesion: continued social and structural change is inherent in economic progress. The ability to adapt to evolving domestic and external conditions, in technology, in markets, in competition, in resource endowments, is a precondition of economic success for small and large countries alike.

At the same time, the record of most economically successful countries has shown that a certain degree of social and cultural cohesion has significantly contributed to sustained economic growth and prosperity over time.

Economic insecurity and the fear of declining incomes, large and growing differences between the rich and the poor, rising unemployment and the economic marginalization of major regions or segments of the population are among the principal threats to the cohesion of advanced industrial countries and of traditional societies faced with resource shortages and the challenge of modernization.

Human resources are the principal potential source of economic growth, of sustained economic performance in the modern world: the creation or the absence of jobs and new activities, the general rise or stagnation of incomes, the ability or inability to provide the conditions for full, active and productive participation in the economy, for all segments of society, in all the regions of a given country, will determine to a large extent its economic success or failure, its social and cultural cohesion in the years ahead.

### **3.5 Productivity, economic growth, telecommunications and social cohesion**

Time and again in modern history fears were expressed about the apparent negative effects of rising productivity: negative effects on employment, on traditional ways of doing things, and ultimately on the traditional social cohesion of economies undergoing a rapid, general rise in productivity.

Yet, increasing productivity is the essential dimension of long-term, sustainable development and economic growth. It is also one of the essential contributions of the information and telecommunications revolution. Both statements are true for industry and agriculture as well as of the expanding service sector.

Improving productivity is the best way to deal with the pressure on natural resources (land, water, raw materials, non-renewable energy sources, and our natural environment), with the general scarcity of capital, and ultimately to make the best use of human resources. Increasing productivity is also the best method for the developing and transition countries to improve their competitive position as well as for reducing the gap in prosperity with the advanced economies.

Productivity improvements lead to a rise in income and generate demand for new products and services.

In order, however, that sectorial or general productivity gains should lead to economic growth and to a general rise in prosperity, there have to be favourable conditions for new initiatives, new enterprises, new products and services, for creating new jobs. It is only under such circumstances that a general rise in productivity will not be a factor of social disruption, but of increased general welfare and social cohesion.

Today, more than ever, ready access to a multitude of information, and to modern telecommunications, is an essential precondition not only for increasing productivity in existing enterprises and for existing lines of products and services, but even more for the creation of the new activities and of new jobs.

This is true not only because a new venture always needs more information than an established one (also, most new ventures are undertaken on the basis of new technical or market information), not only because market success depends increasingly on faster and broader market information, but also, and perhaps primarily, because the characteristics of most of the new activities to be created and which are likely to be successful (and will lead to the creation of jobs) depend much more on information inputs and on telecommunications.

Thus, already today, but increasingly in the future, given the growing role of information, of communications, the opening of markets and the opportunities of the developing and the transition countries to develop new supplies of services, of agricultural and industrial products for their home markets and exports, access or lack of access to information and to modern means of communication will be among the decisive factors of success or failure, for individual enterprises, for a given region, or for entire national economies.

### **3.6 The domestic and international dimensions of the information revolution**

Until relatively recently the “information society” was projected as a development for the future, a development reserved for the richest and economically most advanced countries only. By now, the “information society” has become an economic and social reality not only within and between the industrialized countries, but also in developing countries which are seeking to realize their full social and economic development potential.

The so-called information revolution has two major dimensions:

- a) the international dimension: the increased speed and the increased density of the availability of information, the increased ease of communication that influences the relative political and economic position of each country;
- b) the domestic dimension: who and under what conditions has access to the flow of information and the modern means of communication.

### **3.7 The world-wide character of the information revolution**

The role of telecommunications with respect to social and cultural cohesion has to be seen in the broader context of the so-called “information revolution”. Among the numerous aspects of this information revolution, the following four should be mentioned here: 1) the ongoing technological revolution related to computers as well as telecommunications (hardware and software), 2) the general liberalization and globalization in the flow of information and the regulatory revolution in telecommunications which is leading to an unprecedented freedom in the supply of and demand for telecommunications services, 3) the impact on production structures and competitiveness, and 4) the social, cultural and political dimension and impact of the information and telecommunications revolution.

By now, the fundamental character of the information revolution, of the development of the so-called knowledge-based society is generally acknowledged throughout the world.

The social, cultural and economic challenges and opportunities linked to the information revolution are not limited to the most advanced industrialized countries. They are of equally vital importance for the so-called developing countries as well as for the former socialist economies.

### **3.8 The scope and the nature of the telecommunications revolution**

From a “mature” industry, dominated by government or private monopolies, telecommunications is today one of the most dynamic sectors of the world economy. Virtually all aspects of this sector are undergoing rapid change: the technology, the infrastructure and the hardware of telecommunications, the software linked to the new digital technology, the available services, the regulatory framework as well as the role of the customers, who, from having been relegated for decades to the passive role of “subscribers”, are being empowered as true customers (whether private or business users) whose needs and preferences can no longer be ignored by operators, regulators or equipment suppliers.

The momentum of changes, whether technological or regulatory, is not confined to the richest and most advanced economies and telecommunications markets. This does not mean that there has not been resistance to change also in some of the advanced OECD countries, in particular among the monopoly telecommunication operators.

### **3.9 The telecommunication gap: a major obstacle to economic development and to social stability**

Today, there is a growing concern about the large gap, in terms of the availability and the quality of telecommunications services and infrastructure between the developing countries and the so-called transition economies, on the one hand, and the most advanced industrialized countries, on the other hand. By now it is increasingly realized that this gap is not only an expression of the general difference of the level of economic performance and resources between the two groups of countries, but also a major potential obstacle for the future development and the social stability of the first group of countries.

### **3.10 The telecommunication gap is also the result of past policy errors**

It has been clear for some time that the extent and the gravity of what may be called the “telecommunications gap” is the result not only of resource and technological constraints, but also of policy errors of omission and commission both in the developing countries and in the former socialist countries.

In the socialist countries for many decades the development of telecommunications had been neglected due to two sets of interdependent factors: 1) the excessive emphasis in the communist economic model of “material production” and the general underestimation of all service activities, and 2) the political system aimed at controlling and limiting free communications within the population. The shortage of telephones in the communist countries (in most of the former socialist countries it had taken years for ordinary citizens to obtain a telephone) was a sign of the inefficiency of the economic system and of the lack of freedom of the citizens.

The role of the information society, and the perception of its character and of its requirements are also recognized to have played a major role in the collapse of the communist system: the peaceful end and the outcome of the “cold war” were ultimately an expression of the importance of the freedom of information and communication and of the technological and social momentum and superiority of the “open”, “information-based” societies.

As for the developing countries, for many years, both the theory and the practice of economic development tended to underestimate the importance of telecommunications in economic performance and social development. On the whole, telecommunications infrastructure and services were considered to be less important than energy supply, transportation systems, irrigation projects or social infrastructure such as schools or health care. Telecommunications was often seen as a “luxury”, compared with other infrastructures or so-called productive investments.

It should also be noted that international development agencies, including the World Bank, which until the early 1980s may not have put sufficient emphasis on the importance of information and telecommunications compared with other aspects of infrastructure, have come to realize in recent years that the information revolution and telecommunication infrastructure and services are as important for the developing countries as for the advanced industrialized countries.

### **3.11 Telecommunications and economic development**

In the 1970s and part of the 1980s there was an extensive debate among sociologists and political scientists about the role of information and information flows (and of the freedom of these flows) and the social conditions in the developing countries. Unfortunately, much of this debate had a strong ideological colouring, and most of the authors (who themselves enjoyed full access to modern telecommunications and information sources) greatly underestimated the essential character of telecommunication in improving productivity and raising income levels, and thus also in improving social conditions. An illustration of this essentially negative and politically motivated view of communication and telecommunication tendency was illustrated by the writings, for example, of Armand Mattellart.

### **3.12 From ideology to a recognition of the importance of telecommunications in economic development**

Even apart from the ideologically motivated misinterpretation of the role of free access to information (as illustrated by the 1980 MacBride report), as late as the early 1980s, in essence one could still read in a joint ITU-OECD report on this topic that the positive contribution of telecommunications was based on “a fragile intuition”, and that the positive development impact of telecommunications was much less evident than, for example, that of fertilizers, or general spending on health and education. (see Ghebali, p. 27).

However, at least since the publication of the Maitland Report in 1985, the positive role of telecommunications in economic development began to be more explicitly recognized. (See the survey of various authors and publications on the topic telecommunications and development prepared by Victor-Yves Ghebali. The changing perception of the role of communication and telecommunications in societal development is discussed in some detail in Francis Balle’s book *Médias et sociétés*.)

Today, the importance of telecommunications in the development process is receiving widespread recognition both in academic writings and in the publications of international organizations such as the ITU or the World Bank. (See the ITU’s World Telecommunication Development Reports, or the World Bank Development Report 1994: Infrastructure for Development.)

### **3.13 The importance of access to information and telecommunications in maintaining social and cultural cohesion**

Until recently, traditional economic and sociological theories and analyses have underestimated the role of information flows and of modern communications in economic performance and social cohesion. This was especially true of much of the literature dealing with economic development.

Yet information, like theoretical and practical knowledge, has always been an essential ingredient of economic, social and political success. The strength and prosperity of the advanced industrialized countries, and the social cohesion on which ultimately their success has been based, has always been as closely linked to the free flow and exchange of ideas as to their access to natural resources. The absence of artificial obstacles to the flow of information plays an essential role in technology diffusion and in the diffusion of successful “development models”, at the level of individual enterprises, sectors or the national economy.

Without liberal access to economic and market information there is no “equal opportunity” for individuals, families, companies or whole segments of society. “Information monopoly”, whether it is enforced by the state or by private groups, is an essential tool of enforcing market monopoly and artificial social and economic privileges and thus a major brake on economic performance. “Information and communications” have also been essential elements in education and professional training, thus for both “social and cultural cohesion”.

Thus, there is today a broad consensus among practitioners of development work that any form of monopoly power limiting access to information and to basic telecommunications services (whether for economic, political or administrative reasons) is a major obstacle to successful structural change and development. It is also likely to undermine further the social cohesion, not only rural communities, but also in urban environments and at the level of national economies as a whole.

### **3.14 The nature of structural change**

The objective of economic development is the implementation and the acceleration of sectorial change. A major dimension of this process is the adapting of existing, successful models of more advanced countries to the conditions of a national economy. (On the importance of technology diffusion broadly defined for economic growth and development, see Hieronymi in *Technology and International Relations*.)

Sectorial change – the transformation of the economic and social structure of society – is a source of both new opportunities and of often painful processes of adaptation.

One of the sources of the current economic and social difficulties in the developing countries as well as in the so-called transition countries is the pace of structural and sectorial transformation, not only in their own countries but worldwide.

The current structural changes are the result of a combination of technological changes and of policy-induced changes: the spreading of the model of the market economy, the liberalization in trade and the increased freedom of initiative of individuals and of private companies and organizations at home and internationally.

### **3.15 Structural change and the telecommunications revolution: a threefold challenge**

Even before the start of the current “telecom revolution”, the quality and density of telecommunications networks and intensity of the use of local and long-distance telecommunications services (primarily voice) had been recognized as major indicators of the level of economic as well as social development. Highly developed economies could afford more developed telecommunications networks and the availability of telecommunications contributed to economic growth and to the improvement of the international competitive position of a given country.

The telecommunications revolution has three major facets:

- a) telecommunications is becoming a major factor in economic performance;
- b) for the developing countries and the economies in transition towards the market economy there are both new opportunities and risks (such as unbalanced expansion) and; finally
- c) the availability or lack of access to telecommunications services is affecting the social fabric and the cultural development and cohesion of both the advanced and developing countries alike.

### **3.16 “Quantitative” and “qualitative” change in the role of telecommunications: the need to avoid sectorial and social imbalances**

“Quantitative” change: One of the outstanding features of the last ten years has been the rise in the volume of information being transmitted through the telecommunications system: voice, data, text, images. People spend a growing amount of time in using various telecommunications services both in their private lives and in their work environment. Also, the relative share of long-distance and international communications continues to rise. The ease and frequency of the use of telecommunications have become major characteristics of modern societies. There is also a broad consensus that we are only at the beginning of this trend.

“Qualitative” changes: The growth of volume has been the result of and simultaneously has led to ongoing major qualitative changes both in the telecommunications system and in society at large. The quantitative growth has been made possible by the lower costs, easier access to infrastructure and services, the greater user-orientation of available services, by the introduction of new technologies and of new services: all developments that are expected to continue in the years ahead. At the same time, the way work is organized and the way individuals and families organize and live their lives are profoundly influenced by the availability of telecommunications and the new habits of using telecommunications more widely and more intensively.

These developments exist not only in the most advanced economies, but also in parts of the developing (including the least developed) and transition countries. In itself this is an encouraging phenomenon. Telecommunication homogeneity has never been a desirable nor a feasible goal. Also, some sectors, even in developing countries, have legitimate claims for better telecommunications services than others. Equal access and opportunity for universal service should not be an excuse for aiming at a low common denominator.

There is, however, a danger, in both social terms and in terms of economic performance, if there is a permanent and growing gap in the ease of access to telecommunications services between major economic sectors or groups of society. One of the objectives of balanced telecommunications policies is to avoid the creation of privileged economic or social positions based on access to telecommunications.

### **3.17 Information and telecommunications: regional development and internal migration**

Excessive urban concentrations and large and growing regional imbalances are a major source of problems in many developing and transition economies. Massive internal migrations, the growth of mega cities and of urban ghettos are often a consequence of even worse economic and infrastructure conditions in rural and outlying areas.

While decentralization of economic activities, regional and rural development are internationally recognized major objectives, the nature of the information requirements (and their need of access to telecommunications) of villages and small towns is still not fully understood.

All aspects of life, of existing and new economic activities of villages and small towns depend on information: there is need for technical information (they are too small to have all the necessary experts and specialists present), they need to communicate with sources of spare parts (they are too small to have supplies of everything on a permanent basis), they need information on prices, on markets, on new risks and opportunities beyond their limited geographic horizon.

It is only if such information and communications are readily obtainable that they will be able to increase productivity, attract new investments (and also new development projects which tend to depend heavily on access to telecommunications), to create new activities and jobs, and to retain local labour and attract qualified human resources from outside.

### **3.18 Private initiative, small and medium-sized enterprises and telecommunications**

The dynamic development of small and medium-sized enterprises is generally recognized as an essential condition not only for economic development, the successful development of the market economy, economic growth and the creation of jobs, but also of policies aimed at maintaining and strengthening social cohesion, and the social adherence to the principles of the market economy.

This is not a new insight. The so-called “Mittelstand” policy has been from the start a central element of the concept of the policies of the so-called “social market economy” which for more than forty years have been and remain today at the basis of the success of the German and other economies, including Austria and Switzerland.

The importance of taking into account telecommunications development policies, the need for basic and advanced telecommunications services of small and medium-sized enterprises can be illustrated by the example of various Latin American countries, from Argentina and Venezuela to Panama and Costa Rica, in a recent report published by AHCJET.

### **3.19 The service sector and telecommunications and the developing and transition economies**

The dynamic development of the service sector is today a key characteristic of successful economic development and of a successful transition towards the market economy.

The development of the service sector (which had been greatly neglected both in the socialist economies and in countries pursuing development policies inspired by models of rigid central planning and heavy industrialization) helps strengthen social cohesion both in terms of increased consumer satisfaction and because of its potential for job creation, private and local initiative.

At the same time, the development of virtually all segments of the service sector is heavily dependent on information and on telecommunication services. (See illustrations also of this issue in the Latin American context, for example in the publications of AHCET.)

### **3.20 Globalization, telecommunications and new opportunities for developing and transition economies**

World-wide liberalization and the growing globalization of numerous industrial and service activities present not only a major challenge in the form of increased competition, but also of new opportunities for the developing (including the least developed) and the transition countries: these opportunities include in particular a) freer access to the markets of their neighbours as well as of the advanced economies, b) increased foreign investments, and c) technological, market and production cooperation with foreign-based companies to take advantage of lower production costs and economies of scale.

The development of all these activities require the prior availability of basic, and often also of advanced, telecommunications services. This is especially crucial for small and medium-sized companies (national and foreign) which do not have, or cannot afford to invest in their own telecommunications facilities.

### **3.21 Rural development, information and the monopoly of “middlemen”**

The recognition of the importance of, and of the possibility of promoting social cohesion through rural development has been at the center of various rural development programs, such as the Aga Khan Rural Support Program. An explicit objective of AKRSP is to develop the initiative and autonomy of local communities, their capacity to plan ahead and to deal with unexpected developments. The role of information (and the ability to handle basic technical and market information) and of telecommunications is strongly emphasized by those responsible for developing and running this highly successful program.

In many traditional rural communities, “middlemen” play a key role as sole buyers of products from the farmers, on the one hand, and as quasi-monopoly suppliers of seeds, manufactured products as well as credits to the farmers, on the other hand. Often, farmers are induced to sell their products before the harvest to the “middleman”, at prices and conditions set by the latter. In general, the “middleman” has a monopoly on price and other market information, and, where it exists, also concerning basic telecommunications services. The “middleman” can be a private individual or company or a government bureau.

There is also broad agreement among rural development specialists that breaking the monopoly power of the local “middleman”, whether private or government, is an essential condition for the successful development of rural areas:

- a) in order to strengthen the bargaining position of the producers, to increase productivity and farm incomes, and to better adjust the product range to current market conditions and;
- b) to allow the development of new individual and community initiatives and of new local activities related to the supply of goods and services to the farmers, thereby not only raising incomes and employment but also strengthening social cohesion.

Unrestricted access to basic market information, to other potential buyers, to technical advice, within and beyond the village or a region is a condition for weakening or eliminating the artificial information monopoly of the local or regional “middleman”. Thus, access to basic telecommunications can help weaken a major obstacle to rural diversification and development.

### **3.22 The weakening of traditional social cohesion in the developing countries**

In traditional societies, including communities with great social, ethnic, religious and linguistic diversity (cf. the case of India), social cohesion, between groups and within groups, was partly based on a convergence of local interests and division of labour.

In the developing countries, and in particular in the least developed countries or the least developed regions of the more advanced developing countries, there have been a number of important factors weakening traditional social cohesion:

- 1) Demographic pressures are among the most dramatic factors undermining social cohesion at the level of families, and of the local and national community. They increase the pressure on available resources (land, water, capital, infrastructure), they lead to stagnating or declining real incomes and to rising open or hidden unemployment, and increase the urgency of education, training and the creation of jobs in new activities.
- 2) The wasteful management of natural resources (land, water, forests, etc.) and the deterioration of the environment (telecommunication is an important tool for natural resource management in rich and poor countries alike) are both a consequence and a cause of weakening solidarity and social cohesion.
- 3) Increased competition for shrinking resources, between groups and within traditional communities, becomes a socially disruptive phenomenon, unless competition can lead to improved overall efficiency, the development of new activities and an overall rise in incomes.
- 4) Excessive urbanization, the growth of urban “ghettoes” and the marginalization of large and growing segments of the population are the result of a complex set of factors, including the fact that conditions for creating and finding jobs in new activities are even worse in rural areas than in the large urban agglomerations.
- 5) Liberalization and market reform are a world-wide phenomenon resulting from the general failure of rigid economic planning and centralized controls. By stimulating competition and by increased rewards for efficiency and market sanctions of inefficiency, they can lead, at least temporarily, to increased social tensions both in developed and developing countries.

### 3.23 Telecommunications and the crisis of social cohesion in the former socialist countries

It is no overstatement that, without a telecommunications revolution, a successful transition to democracy and a stable market economy in the former socialist countries would be inconceivable.

Ever since the 1917 Bolshevik revolution, one of the central objectives of Soviet policy had been the breaking up, the elimination of the “old” social cohesion in order to create a “new society”, a “new socialist man”, whose main or exclusive allegiance was to the Party.

This policy was brutally implemented in the former Soviet Union as well as in the former socialist countries in Eastern and Central Europe, in Cuba and wherever the Soviet model was imposed by force. Strict control over information and the means of information and communications was one of the key instruments of social and political control. The artificially maintained shortage of telephones (one had to belong to the *nomenklatura* or to be ready and able to pay *de facto* bribes in order to overcome the endless waiting lists) was only one of the most visible aspects of this policy.

Many foreign observers (even among those not sympathizing with the Communist doctrine and policies) were readily misled to believe that these countries had succeeded, despite their poor economic performance and the political oppression, in producing a new type of social cohesion. In fact, comparative studies carried out in the 1980s (before the collapse of communism, but at a time when such studies could already be undertaken) showed that, according to most indicators, social cohesion (at the local, regional and national level) in the socialist countries was much weaker than in Western societies and market economies.

The artificial restrictions on the means of communications and on the free flow of information were widely perceived as a significant factor in weakening social cohesion. It also contributed to the general social dependency syndrome, which these societies have to overcome in the years to come. The direct negative impact was augmented by the general negative impact on economic performance resulting from the inability to participate fully in the technological progress involved in the development of the “information society”.

### 3.24 Reconstruction, the development of the market economy and social and regional balance in the transition economies

The gap between the quality and density of telecommunications services and the general educational and cultural level of society is particularly striking in the former socialist countries.



The dynamic expansion of the private economy, of private initiative, of the creation of new enterprises and jobs, the successful encouraging of domestic and foreign investments are all part of the transition process.

These are all both economic and social priority objectives. The availability or the lack of telecommunication services can make the difference between stagnation and the maintenance of old monopolies and privileges, and the creation of dynamic new “equal opportunities” both for entrepreneurs and for the rest of society.

A rapid and balanced expansion and upgrading of the telecommunication systems in these countries is essential for:

- a) modernizing their economies (both in industry and agriculture and through the development of the long-neglected service sectors), improving their general competitive position and facilitating their integration into the world economy; and
- b) avoiding or reversing the marginalization of large regions or segments of society, the development or deepening of new social and regional schisms, of large differences between those who are successful and “westernized” and those who have greater difficulty in adjusting to the challenges and opportunities of the competitive market economy.

By now the complexity of the transition from a centrally state-controlled economy to competitive market economies based on decentralized private initiative is a complex process. This transition involves high economic and social costs and adjustment. It requires a major effort from people in their private and professional life.

There is a broad consensus among national and international experts that a failure to deal with the telecommunication gap, and the societal challenges of the competitive information society, could not only slow down global economic transition and growth, but could also weaken the social acceptance of the concept of the market economy.

### **3.25 Dealing with the “telecommunication gap” in the transition economies**

The need to halt and to reverse the widespread neglect of infrastructure maintenance and development, which had been one of the hallmarks and one of the most burdensome legacies, in both economic and social terms, of “socialism” in the former Soviet Union and Eastern and Central Europe, was largely evident at the time of the collapse of the communist system.

It was also widely recognized from the start that improving and expanding the inefficient and insufficient telecommunication system was one of the preconditions of successful economic reconstruction and transformation in these countries. (See Otto Hieronymi: *Economic Policies for the New Hungary*.)

The need for innovative approaches in the so-called “transition economies”, both at the technical level and in terms of the interaction in the telecommunications sector between the government authorities and the private sector, is a major theme in this field of the analyses and recommendations of the European Bank for Reconstruction and Development.

An innovative approach is necessary from an economic, and directly or indirectly also from a social point of view: it is necessary in order to make the best use of scarce financial and human resources in order to diminish the “international”, the “qualitative” and the “domestic” telecommunication gap.

In fact, during the last five years, in most former socialist countries systematic efforts have been undertaken to improve and expand telecommunication infrastructure and services. Besides the former East Germany, which had benefited from massive transfers of financial and human resources and experience also in this sector, several other transition countries have also achieved notable results in telecommunications.

**Box 9****The case of Hungary**

The above statement can be illustrated by the Hungarian example. Despite its earlier efforts at economic reform, Hungary, like the other “socialist” countries, suffered from the low density, poor service quality and technological backwardness of its telecommunications system.

As a result of a determined government policy (the introduction of competition, the encouragement of mobile telephony and the partial privatization of the State telecommunications company at the end of 1993), the density of direct exchange lines has more than doubled since 1990. The modernization process also includes the development of advanced services and efforts to ensure the “telecom development” of rural and outlying areas.

At the beginning of the decade, the basic telephone density in Hungary was at about the level of South Africa or of Venezuela. Currently, it is close to half of the level of the advanced industrialized countries, and could approach their average level (in terms of basic services) around the year 2000.

The need for flexibility and of innovative approaches was recognized, e.g. in the encouragement of the expansion of the mobile telephone network. Currently, according to the last Annual Report of MATAV, the number of mobile telephone subscribers is around 300 000, having doubled in 1995, a very high relative penetration rate compared for example with most of the Western European countries. Clearly, in Hungary the mobile phone is not merely a “status symbol”.

The importance of the expansion of the mobile telephone network has been important in Hungary not only in helping speed up the overall “catching-up” process and short-cutting the still existing (although rapidly shortening) waiting lists for fixed connections. It has also facilitated the extraordinary growth of the number of new private enterprises throughout the country. Today, the mobile phone in Hungary is a reliable and efficient instrument for doing business for tens of thousands of new entrepreneurs, most of whom had been employed in the past in safe government guaranteed jobs.

Hungary, as the other transition countries, is still facing major tasks in creating the conditions for sustained economic growth, including the telecommunication sector. The principal positive achievements of the Hungarian transition process since 1990 include: a) the large inflow of foreign direct investments (about 50% for the whole region), b) the creation of hundreds of thousands of new private enterprises, c) the rapid integration of Hungarian companies and exports in Western markets, and d) last but not least, the relative social stability in the country. There is general consensus among Hungarian and foreign experts that these results could not have been achieved without major efforts in the telecommunications area and without major qualitative and quantitative improvements throughout the country.

### 3.26 The dimensions of the telecommunication gap

Sociologists, economists as well as policy makers are becoming increasingly aware of the dangers inherent in the international and domestic dimension of the so-called telecommunication gap. Should this gap persist or continue to widen in the years ahead between the advanced industrialized countries, on the one hand, and the developing economies and the transition countries, on the other, this would represent a major threat to the social cohesion of the second group of countries. This threat could be aggravated by the persistence or the widening of the “domestic gap”, i.e. if large segments of society were to continue to have no access to telecommunication services.

The so-called telecommunication gap – the differences in access to basic and advanced telecommunication services – has three main dimensions:

- 1) the “international gap”, i.e. the differences between individual countries and groups of countries,
- 2) the “qualitative” and “technological gap” showing differences in the quality of services, and increasingly also in the share of advanced services in the total telecommunication market,
- 3) the “domestic gap”, the regional differences in access to telecommunication and differences in access between social and economic groups within a given country.

In the past, it was relatively easier to deal with this problem (cf. the case of France in the 1970s) because of the relative saturation in the most advanced countries and the relative “maturity” of telecommunications technology.

Today, this task, i.e. to avoid the widening of the gap, or to narrow the gap, has become more complex and requires an even greater effort because of the explosive changes in the advanced countries. At the same time, the declining cost of technology and infrastructure, the development of new technologies and the increased competition in telecommunication work in favour of the countries that are willing to make a determined effort to narrow the gap (see the case of Hungary).

### 3.27 The international gap

The problem of the international gap, i.e. the gap between the advanced industrialized countries and the developing and least developed countries in the transition countries, has been recognized for some time in general terms: the objective has been not only to keep the gap from growing but also to try to reduce it.

The countries covered in the present issue paper can be divided into three broad groups:

- 1) the former socialist countries in transition towards the market economy,
- 2) the more advanced developing countries, and
- 3) the so-called least developed countries.

There are considerable differences in the telecommunication situation between these major groups of countries and within each group.

Using the World Bank classification of countries by income levels, the ITU data for the most common traditional indicator of telecommunication density (number of main telephone lines per 100 population) showed the following levels at the end of 1994 for the principal groups of countries:

- |   |       |
|---|-------|
| 1) Low income countries (59 countries)          | 1.48  |
| 2) Lower middle income countries (68 countries) | 8.40  |
| 3) Upper middle income countries (38 countries) | 14.14 |
| 4) High income countries (38 countries)         | 51.92 |

(World total: 11.57)

For the 48 countries identified in a 1995 ITU report as “telecommunication least developed”, this average stood at the end of 1993 at 0.65.

The state of telecommunications in the various countries regarding density and quality of telecommunication infrastructure and services, and the density or frequency of the usage, is essentially determined by:

- a) the level of income (wealth, resource and demand effect); and
- b) the cumulative impact of telecommunication policies and strategies (regulatory and supply effect).

These two sets of factors are interdependent and until recently have tended to reinforce each other.

### 3.28 The technological and qualitative gap

Three aspects of the technological gap should be mentioned in the context of the present paper:

- a) the basic telephone (voice) still represents by far the largest share of telecommunication demand, also in the developed countries. Nevertheless, the developing and transition countries have to concentrate not only on reducing the gap in the basic telephone service, but also on the introduction and diffusion of advanced, customer-oriented telecommunication services;
- b) there is also a technological gap in terms of human resources required for planning, implementing and managing new telecommunications services;
- c) there is also a need, especially in the least developed countries, to promote through adequate information and education the efficient utilization of modern telecommunications services.

### 3.29 The domestic gap and the importance of universal service

The term “domestic telecommunication gap” is used here to describe the differences in the availability of telecommunication infrastructure and services between urban and rural areas, as well as for different segments of society. For large areas and a large share of the population of the developing countries, this “relative” gap in telecommunication is even more dramatic than the one shown by the international comparisons of average numbers.

In the past, under the traditional telecommunication monopolies in the more advanced countries, the concept of universal service was meant to assure that areas with a lower concentration of potential subscribers should not suffer from an inadequate supply of telecommunication infrastructure and services, or from excessively high tariffs. Currently, liberalization, competition, the emphasis on cost-based pricing, as well as technological developments, have led to a revision and narrowing of the concept of universal service: full territorial coverage for all infrastructure and services may no longer be the rule in the most advanced countries either.

In view of the high cost (especially of the initial investments) of assuring universal service, in the developing countries there is a danger that, even if there is a narrowing of the “international” or of the “technological” gap, the “domestic gap” could continue to widen, with growing negative economic and social consequences.

## 4 Selected policy implications

### 4.1 Global and telecommunication policies

The objective of the present analysis was not to prepare detailed recommendations for global economic and social policies or for telecommunications policies and strategies in the developing and transition economies. One of the objectives of further research, suggested in the following section, could be to help prepare more detailed and specific recommendations.

The following are summary indications of some of the major policy implications of the issues raised in the present paper:

- a) At the level of global economic policies, it should be remembered that there is no contradiction, but rather a positive relationship between a dynamic market economy and a successful development and growth record and social and cultural cohesion. Social cohesion is not a privilege of rich and developed countries, but rather a precondition for creating economic prosperity. This is one of the main lessons of the economic history of many European (including Germany) and non-European countries (including the United States and Japan) during the last half century. This conclusion is also supported by the record of the most successful developing countries.
- b) Telecommunications development efforts ought to take into account the social dimension, not for distributive purposes, but in order to create a broad basis for economic initiative and performance. The principal social importance of access to telecommunication services is that it helps create economic opportunities and increase performance.
- c) Telecommunication policies and strategies ought to be user-oriented. The interests of current or potential telecommunications users should not be disregarded in favour of the privileges or vested interests of operators or equipment suppliers.
- d) The importance and possibility of not only catching up but also of “leap-frogging” in telecommunications can be best illustrated with the example of France in the 1960s and 1970s. In today’s liberalized and competitive markets, and given the new technological developments, these possibilities also exist and should be fully used by both developing and transition economies.
- e) It should also be pointed out that both catching-up and leap-frogging mean that it is not enough to develop basic infrastructure and services, but that encouraging the development and use of advanced services is also a precondition for successful development.
- f) Universal service has to be redefined and applied in a flexible manner: however, without an economically, socially and regionally valid and viable application of the universal service concept, neither the economic nor the social benefits of telecommunications can be fully realized.
- g) Governments and international organizations should encourage the opening of markets for equipment (such as robust PBXs for rural areas), software and services specifically adapted for outlying and rural areas in order to allow economies of scale and more affordable prices.

## 5 Suggestions for further study and data collection

### 5.1 The need for further research

As a result of technological, policy and structural changes, there has been also a fundamental shift in analytical and theoretical research and writings. Today, the concepts of “information society” and “information revolution” have become basic components of both economic and social analysis. There is also a general consensus that access to information and to telecommunication services will play a growing role in the future in maintaining and strengthening social and cultural cohesion. This is widely recognized and documented in the advanced industrialized countries, but it is equally true in the developing economies and in the countries in transition from socialist to market economies.

Today, there is a vast and growing body of qualitative and quantitative research on the cultural and social dimension of the information society and in particular about the role of advanced telecommunications services in this context. However, the bulk of these qualitative and quantitative analyses deals with the situation and the prospects in the advanced market economies.

### 5.2 Suggested directions of research

Thus, further research on the topic of the present issue paper could fall into three broad categories:

- 1) the analysis of the general impact of the information and telecommunications revolution on social and cultural cohesion in the developing and transition economies, and the consequences of a continued or widening gap compared with the advanced economies;
- 2) designing and carrying out in-depth case studies dealing with: a) individual countries of different size and conditions, and b) with specific sectors;
- 3) the identification of indicators dealing with the domestic telecommunication gap.

The general analysis mentioned under 1) would take into account the principal results of the analyses relating to the advanced industrialized countries and the specific situation of the developing and transition economies. The results of this project would be useful in defining the methodology for tasks 2) and 3) mentioned above.

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## ANNEX 1

## Contributions received

Contact person	Admn/Sector Member	Title	Doc. No.	Date
	SR TELECOM, Canada	ITU Rural Telecommunication Seminar for the Americas Region	1/8	3.2.95
	Mauritania	Role of Telecommunications in Economic, Social and Cultural Development in Mauritania	1/18	15.2.95
	Canada	Action Plan on Telecommunication Development	1/25	19.4.95
	Kenya	Contribution	1/59	9.3.95
	Canada	Cross-sectoral development impact of telecommunications	1/64	10.3.95
F. Bertrand	CIDA, Canada	The importance of synergy in the work of the development sector		
	Telemalta	The application of telecommunication infrastructure in a corporate data network		
	INTELCAM, Cameroun	Stratégies et politiques de développement des télécommunications	1/107	15.11.95
	Afghanistan	Present state of telecom services in Afghanistan and prospects for development	1/160	7.12.95
	Chad	Contribution	133	
Director, TSB	Chairman SG 13	Global Information Infrastructure		12.7.96
O. Hieronymi	Webster University Geneva	The role of telecommunications in promoting social and cultural cohesion		
G. Dupont	UNESCO	Information and Communication Technologies in Development: A UNESCO Perspective		
M. Toumi	Expert, ITU	Etude support "Télécommunications et développement économique, etc."		
H. Yushkiavitshus	UNESCO	The Right to Communicate		
D. Wright	INMARSAT	A Solution to Universal Service		
Anna Spiteri/Joe Pace	Telemalta	Enabling Technologies for Better Quality of Life		
S. Ddungu	Uganda	Role of Telecommunications		
SA Ould Kerkoub	Mauritania	Le développement du secteur de la pêche		
M. Valencia	INTELSAT	Contribution to Draft Final Report (10 January 1997)		

