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Telecommunications in Ethiopia

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TELECOMMUNICATIONS IN ETHIOPIA: PAST, PRESENT, AND FUTURE

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The history of telecommunications in Ethiopia--from its introduction to the present day--spans one hundred years. Since very little of this history has been documented, this chapter will provide some basic facts and figures as well as a brief analytical account of the development of the country's telecommunications sector. The chapter is divided into three main parts:

(1) an introduction to Ethiopia giving brief accounts of its geography, economy, resources, and population size and distribution; (2) a history of the development of the telecommunications system, including the introduction of telecommunications services into the country and the milestones of the early years (1894-1941), the sector's postwar rehabilitation and expansion work, the evolution of the system's organizational structure, and

the accomplishments and problems of subsequent package development programs; and, finally, (3) a discussion of the future of telecommunications services in Ethiopia in light of the objectives of the economic policy of Ethiopia's new transitional government. We will conclude the chapter with some general observations and recommendations for the future development of the sector.

1.0 INTRODUCTION

1.1 The Country

Ethiopia is located in what is generally known as the Horn of Africa at the intersection of the busy sea routes and crossroads that connect the African continent to the Middle East and India. With an area of 1,112,032 square kilometers, Ethiopia is one of the seven largest political entities in Africa and is bounded by Sudan to the west and northwest, Eritrea to the northeast, Djibouti and Somalia on the eastern coast, and Kenya to the south. The country's topography ranges between hilly uplands and low-lying valleys, and the climate is divided into a dry season (November through February) and two rainy seasons (a moderate rainy season between March and May and a heavy rainy season between June and October).

1.2 The Economy

Agriculture is the mainstay of the economy, accounting for about 48 percent of the country's GDP in 1994. The industrial sector, which includes mining & quarrying, manufacturing, small scale industries and handicrafts, electricity and water as well as construction, maintained a share of only 11 percent of GDP in 1994 showing a drop of 3 percent from the level it had reached a decade earlier. Services, consisting of trade, hotels, transport and communications, banking, insurance, real estate, public administration & defence, education, health and other related services, have increased their share of GDP from 34 percent in 1984 to 41 percent in 1994.

Throughout the 1980s, Ethiopia's socioeconomic development was seriously affected by repeated droughts and civil strife. The droughts of 1984-85, in particular, resulted in large-scale famine affecting millions of people. The internal conflict which reached its peak in 1990/91, was also a major cause for the country's poor economic performance of that period. By 1991, industries were on the average operating at 25 percent of capacity.

1.3 Resources

The most promising element in Ethiopia's physical resource base is its potential for agricultural production. Only 14.5 percent of the country's 80 million hectares of arable land is under identifiable crop production.

Ethiopia has some 75 million cattle, camels, sheep, and goats--the largest livestock population on the African continent. In fact, livestock contributes about 40 percent of the total value of Ethiopia's agricultural output, which is the equivalent of the combined value of its wheat cereals, oilseeds, and other field crops. In the mid-1990s, there was a substantial unrealized potential for increasing the value of the country's livestock output.

In the mid-1990s, Ethiopia's energy sources were just beginning to be explored for development. Hydroelectric energy from newly commissioned projects contributed about 85 percent of the country's electric power in the mid-1990s, and a natural gas resource had been discovered in the Ogaden region. Previously underexploited

minerals, especially primary gold, were also known to exist along with potential resources of soda ash, tantalum, marble, potash, and base metals.

1.4 Population

The first census conducted in Ethiopia in 1984 showed the population to be 42.2 million, including Eritrea which became a separate state in May 1991. Assuming a 3.1 percent growth rate and other factors remaining constant, the population was estimated to have reached 52.5 million at the end of 1991. Forty-six percent of the country's population are under fifteen years of age, and in 1984 the country's total fertility rate was about 7.5 per woman with a death rate estimated at around 15.2 per thousand population. According to a

1984 Central Statistics Office report, life expectancy at birth in Ethiopia was about 51.9 years.

Eighty-six percent of Ethiopia's population was engaged in rural-based economic activity in the mid-1990s, mainly in agriculture in the highland areas. About 3 percent of the rural population lived in the lowlands and was engaged primarily in raising cattle. The urban population, which is concentrated in a few towns, was growing at an annual average of 5.5 percent in the mid-1990s, and at the end of 1994, the total urban population was about 8.4 million. (Central Statistical Authority, Statistical Abstract 1990). Roughly 26.1 percent of Ethiopia's urban population lives in Addis Ababa.

2.0 ETHIOPIA'S TELECOMMUNICATIONS: THE PAST

2.1 Early Years (1894-1941)

Because Ethiopia had no colonial history--except for a brief five-year occupation period between 1935 and 1941,--the history of the country's telecommunications sector can be roughly divided into the "early years" and a "postwar period." Telecommunications service was introduced in Ethiopia in 1894 during the rule of Emperor Menelik II. The first major telephone line construction spanned a total distance of about 477 kilometers and connected Harrar, a major trade center in the eastern region, with Addis Ababa, the capital city. The line, which took only two years to construct, also interconnected small towns situated along the route. Immediately after the telephone line, a telegraph line was installed following the construction of the first and only railway line in the country--the Ethio-Djibouti railway. Within two years, an 880-kilometer north-south telephone line connecting Asmara the capital of Eritrea, to Addis Ababa was constructed and made operational in 1904. The "verbal repeater" system was used to facilitate long distance calls, making use of the several intermediate stations opened at the small towns and villages along the route.

Several routes branching out from Addis Ababa to connect provincial administrative centers and major towns were being extended in advance of the construction of the road network. Pack animals were used to transport material and

equipment. By 1930, a route distance of 7,000 kilometers was completed and over 170 towns were being served by the telephone network. The development of Ethiopia's long distance telephone network, particularly in reaching the country's strategic areas and border towns, was a remarkable feat given the rugged terrain and the absence of modern transport systems. International communication services, however, took longer to develop. Until the end of 1930, Asmara and Djibouti, both under colonial rule at the time, were the only two locations with international connections.

Administratively, Ethiopia's communications system was run by an office in the Imperial Palace--where it was accorded the direct attention and supervision of the emperor aided by the assistance of foreign experts (who in 1907 were replaced by Ethiopians). In the early years of the 19th century, a group of French experts undertook a project to study and restructure Ethiopia's telecommunications and postal administrations. This took more than two years (1909-11) and became the cornerstone for the establishment of the country's Ministry of Posts, Telegraph, Telephone. As the century progressed, demand for telephone service grew at a rapid pace, and new stations extending in different directions were added in various parts of the country.

Meanwhile, hostilities among the competing colonial powers--Britain, France, and Italy--were growing in the Horn of Africa, putting Ethiopia's sovereignty and independence in a precarious position. The Emperor was forced to move fast and took action to safeguard the country's sovereignty. A member both of the League of Nations and since 1932 the International Telecommunications Union (ITU), Ethiopia

consequently took steps to free itself from a dependence on the foreign administration of its international traffic. By 1934, Ethiopia had established direct radio telephone links with Cairo, Djibouti, Aden, and London and soon after established a radio communications training center for Ethiopians in order to replace the expatriates handling the nation's traffic (which included confidential state affairs).

When war inevitably broke out and the fascist powers invaded Ethiopia, telecommunications facilities were targeted for destruction to deprive the resistance forces of access to information. Most of Ethiopia's telecommunications installations and facilities were destroyed and both local and international communications disrupted. Realizing, however, that telecommunications links were vital to their operations, the Italian forces soon made efforts to restore what they had destroyed. In their turn, Ethiopian resistance forces put these rehabilitated lines out of service and disrupted restoration efforts. Despite their earlier efforts, toward the end of the period of occupation the Italians had begun to restore Ethiopia's telecommunications system, installing automated telephone exchanges in Addis Ababa and Asmara (with a capacity of 1,500 and 1,200 lines, respectively). By 1941, as the Italian forces finally fled the country, they destroyed the telephone service in approximately one hundred Ethiopian towns, which they themselves had restored. As a result, by the end of the war only a handful of Ethiopia's stations were functioning, and then very poorly.

2.2 Rehabilitation and Expansion of the Network (1941-73)

2.2.1 The Early Postwar Period

The history of the initial period of postwar telecommunications in Ethiopia is essentially a history of network rehabilitation and restoration. The Ministry of Posts, Telegraph, and Telephone was reestablished, and the enormous task of reconstruction began shortly thereafter. Some of the country's distant stations were provided with temporary service by radio telephone, and the radio transmitting station at the southwest end of Addis Ababa was rehabilitated and placed back in service. But the task of rehabilitating the damaged infrastructure in all sectors of Ethiopia's economy was huge and almost insurmountable. Since funds and skilled manpower were unavailable in sufficient numbers, international aid agencies had to be approached. In April and May 1950, first International Bank of Reconstructions and Development (IBRD) mission (which consisted of the organization's founder, Eric Beecroft, and other bank officials) came to Ethiopia to conduct an investigation of the possibility of reforming the ministry and creating an organization entrusted with the sole responsibility of restoring and extending Ethiopia's telecommunications services. (The technical part of their study was actually made by a group of experts of the International Telephone and Telegraph Corporation [ITTC].) The study proposed a short-term (three-year) US$2.2 million investment program to be carried out as an initial rehabilitation project. It also proposed the establishment of a semiautonomous telecommunications body charged with the maintenance and development of the country's telecommunications network.

2.2.1.1 Establishment and Evolution of IBTE

In 1952, the proposals made by the ITTC's technical experts were accepted, and the establishment of the quasigovernmental Telecommunications Board was approved by the Ethiopian government. Subsequently, the Imperial Board of Telecommunications of Ethiopia (IBTE) was established as a chartered organization by Proclamation No. 131 in October 1952. The organization was to be independent of the Ministry of Posts, Telegraph, and Telephone and had the following main objectives:

. to rehabilitate, extend, and maintain Ethiopia's telecommunications facilities and to engage on a for-profit basis in the civilian telecommunications business;

. to act as an agent for the Ethiopian government in all matters relating to telecommunications services in and outside the country; and

. to establi ÿ appropriate training procedures and a training institute for present and future board personnel.

In addition to these specific objectives, the IBTE's overall purpose was to provide and efficiently maintain satisfactory telecommunications services for the general public. In order to achieve these objectives and meet the ever growing demand for services, the IBTE has periodically undertaken structural reforms and modifications to its organization.

2.2.1.2 Reorganization Efforts

The Imperial Board of Telecommunications of Ethiopia (IBTE) began operations as an autonomous body on 1 January 1953 with an organizational structure appropriate to its functions at the time. This first organizational arrangement, which took effect in March 1953, remained in place for about a decade. Under this structure, decision making was highly centralized--partly because of the shortage of highly skilled manpower and partly due to the need for both closer follow-up and stronger control of activities.

The most recent change to the IBTE--which is still in force--took place in 1971. A new hierarchical structure extending from the General Manager to departments, divisions, regions, branches, areas, subareas, sections, and units or offices was established under the name Ethiopian Telecommunication Authority (ETA), which was comprised of the following three departments and respective divisions:

I. Finance and Supply Department

- Finance Division
- Supply Division

II. Operations Department

- Traffic Division
- Maintenance Coordination Division

. Seven Regions (Central, Northern, Eastern, Western, Northwestern, Northeastern, and Southern)

III. Engineering Department

. Radio Division

. Telephone Division

. Civil Engineering Division

In addition to the departments, other divisions (the Administrations Division and the Planning and Programming Division) and offices (internal audit, public relations, legal service, and so on) directly responsible to the office of the General Manager were established:

The organizational structure created in 1971 is now over twenty-three years old, and since then a considerable number of changes have taken place in the field of telecommunications. The number of subscribers, for example, has almost doubled and in the 1990s demand continued to grow quickly. The types of services offered and the area of coverage provided has also expanded, and rapid advances in telecommunications technology have presented new challenges and responsibilities. The ETA will have to reorganize itself to face these challenges and live up to the expectations of the coming years. To this end, a thorough study was carried out by the Authority in the early 1990s and submitted to the Board of Directors for consideration.

After a long delay, the proposed structure was rejected and a new Group was formed in 1994 to carry out a new study and come up with an alternative proposal.

2.3 Recent Telecommunications Development

It has been nearly one hundred years since the telephone was introduced in Ethiopia and about four decades since a systematic approach to the development of the country's telecommunications was adopted. In that time, many observers, including the World Bank (see, for example, its World Development Report, 1983) have rated Ethiopia's achievements in the telecommunications sector in relation to other developing countries as good. Indeed, in terms of telephone density, quality of service, labor productivity, and affordability, the Ethiopian telecommunications service compares favorably with many African countries.

In the mid-1990s, however, Ethiopia's economic development, as measured by indicators such as GDP, was still one of the lowest in Africa. The structure of the country's economic production in the mid- 1990s has changed very little since the early 1980s, with agriculture's share of GDP at 48 percent, industry's (consisting of manufacturing, electricity, water, construction, and mining) at only 11 percent, services at a respectable 41 percent, . By comparison, according to the World Development Report of 1989, the GDP share of agriculture and industry in subsaharan Africa was 31 percent and 26 percent, respectively, in 1987.

As the figures in Table 2.1 clearly indicate, Ethiopia's industrialization is still

in its infancy. The agricultural sector is dominated by subsistence production, for example, and the value-added of the services sector comes mainly from wholesale and retail trade as well as from public administration and defence.

In 1991, telecommunications contributed about 1 percent of Ethiopia' s GDP--not an unexpected figure for an economy characterized by subsistence agriculture. On the other hand, the vital role telecommunications services play in economic development can only be determined by accounting for both its direct and indirect contributions, such as the rise in productivity and efficiency of other economic sectors as a result of the increased availability of reliable telecommunications services.

Ethiopia's pattern of investment in telecommunications closely follows the movement of the country's gross domestic investment. Because Ethiopia has been the scene of a series of protracted internal conflicts and recurrent droughts over the last two decades, it is not surprising that its rate of gross fixed capital formation as a percentage of GDP has been four percentage points lower than the rate for subsaharan Africa (roughly 11 percent versus 15 percent, respectively). During the same period, Ethiopia's rate of investment in telecommunications has fluctuated at around 0.4 percent of GDP.

Table 2.1 GDP, GFCF. and Telecommunications Investment

(in millions of Birr*)

Year	1983	1985	1987	1988	1989	1990	1991	1992*	1993*
GDP at market price	9760	9924	11399	11851	12414	12586	12772	12363*	13884
GFCF at market price	1240	1540	1797	1873	1660	1534	1420	1088	2221
Telcom Investment	10	16	70	50	60	23	38	17	68
Telcom Investment as percentage of GDP	0.18	0.16	0.61	0.42	0.48	0.18	0.30	0.14	0.49
Telcom Investment as percentage of GFCF	0.8	1.0	3.9	2.7	3.6	1.5	2.7	1.6	3.1
Telcom contribution: percentage of GDP	0.61	0.76	0.88	0.92	0.73	0.85	0.91	9.92	0.98

Source: ETA's Statistical Bulletins (1987-93); ONCCP Plan documents (1985-93); Revised series of National accounts statistics of Ethiopia Advance Summary Report (A Draft) * Excludes Eritrea

Note: The Birr is the Ethiopian currency. Before its devaluation in 1992, 1 US $ = 2.07 Birr. The official exchange rate at the end of 1994 was 1 US$ = 5.90 Birr.

Since its inception, the ETA's investment activities have been carried out through the "development program" approach. The achievements of this approach and the problems the ETA has encountered in the investment process are described briefly in the following sections.

2.3.1 The First Four Telecommunications Development Programs (1958-73)

Since the establishment in 1953 of what was then known as the Imperial Board of Telecommunications of Ethiopia (IBTE) (currently known as Ethiopian Telecommunication Authority or ETA) as a semiautonomous organization, six development programs have been carried out in Ethiopia. During the first four development programs, implemented between 1958 and 1973, a total investment of US$50.2 million was made. These development programs were financed partly from

the Board's own funds (45.4 percent) and partly from external sources--28.8 percent from an International Bank of Reconstructions and Development (IBRD) loan, 22.3 percent from a Swedish International Development Agency (SIDA) loan, and 3.5 percent from a USAID grant.

By the end of the Fourth Telecommunications Development Program, Ethiopia's telephone service had reached 343 cities and towns and there were 47,263 telephone subscribers, a total of 63,689 telephones, and 271 telex subscribers.

2.3.2 The Fifth Telecommunications Development Program (1974-79)

The Fifth Telecommunications Development Program (FTDP) was originally planned to be implemented during the 1974-79 five-year period. The actual implementation of the program, however, began in 1975 and lasted until 1984. During this period Ethiopia experienced major political and economic difficulties. Widespread internal conflict and foreign aggression had already exacerbated the country's shortage of such critical development inputs as construction materials and foreign exchange. On the international scene, the late 1970s and early 1980s was a period in which the price of both oil and manufactured goods was rising rapidly. The value of the Japanese yen was also rising, making Japanese equipment harder for the ETA to afford.

Although the total planned capital outlay for the Fifth Program was close to US$62 million, the actual expenditure was over US$72 million. Urban exchanges alone required 52 percent more than the planned outlay.

The achievements of the FTDP can be summarized as follows:

. ten new automatic exchanges with a total line capacity of 32,200 were installed;

. the capacity of existing exchanges in eighteen towns (including the capital city) was raised by a total of 22,000 lines;

. subscriber trunk dialing service was introduced into six towns;

. a total route length of 1,917 kilometers of microwave radio relay system, linking a number of regional capitals to Addis Ababa, was established;

. a satellite earth station and an automatic telex exchange were put into service to cater to international routes. By June 1985 Ethiopia had direct satellite links with a total of thirteen citiesin Africa, Asia, Europe, and the United States; and direct microwave links were established with Djibouti, Kenya, and Tanzania.

2.3.2.1 Financing the Fifth Development Program

The FTDP required about US$38.6 million in foreign exchange and US$21.8 million in local currency. The foreign exchange was mainly raised through external borrowing from the International Development Association (IDA), which extended a soft loan amounting to US$34 million. The rest was provided by internal resources.

Ethiopia's previous development programs had been financed by the ETA's own funds as well as by loans from the IBRD and, to a lesser extent, SIDA.

2.3.3 The Sixth Telecommunications Development Program (1984-91)

The Sixth Telecommunications Development Program (SXTDP), which was originally planned for 1984-88, was extended to 1993 for a number of reasons, the most important being inadequate implementation capacity, shortage of construction materials and foreign exchange, and delays in the mobilization of funds from donors. The SXTDP differed significantly from the FTDP in the amount of capital expenditure planned, in the targets it set out to achieve, and in the level of technology employed.

The total investment of the SXTDP amounted to US$150 million, 150 percent higher than that of the FTDP. Of the total expenditure of US$150 million, imports of equipment and machinery (switching, network, transmission, and auxiliary equipment) as well as vehicles and supporting materials accounted for 65 percent.

The SXTDP set out to raise the country's telephone exchange capacity from 123,900 at the beginning of 1984 to 195,000 lines in 1988. The actual figure for the target year was 125,665--35.6 percent short of the goal. Similarly, subscriptions were expected to grow at an average annual rate of 12 percent from 89,544 in June 1984 to 140,000 direct exchange lines (DELs) in June 1988. However, the actual number of subscribers in 1988 was 24.3 percent below target.

Given the overall weakness in Ethiopia's economic performance in the second half

of the 1980s and the ETA's inability to attract adequate funds in time, the actual achievements of the SXDTP can be rated as satisfactory. Other achievements of the SXDTP included the following:

- subscriber trunk dialing facilities were extended to twenty-seven towns--an increase of 69 percent on the figure at the beginning of the program;
- rural telecommunications penetration was raised by opening an additional 150 public call offices;
- international direct dialing was introduced in some exchange areas; and
- the second satellite earth station (standard A) working with the Indian Ocean satellite space segment was established in 1986.

2.3.3.1 Financing the Sixth Development Program

The SXTDP was financed partly by the ETA's own funds and partly by external credit. The ETA's own funds covered all of the local expenditures, amounting to US$48.4 million. The foreign exchange component of the total investment-- amounting to US$102 million--was acquired from four external sources. The main sources were the IDA, which contributed US$40 million, the African Development Bank (ADB) and the Government of Italy, which each extended a loan of US$25 million, and the Government of Sweden, which had a share of US$12 million.

2.3.4 The Seventh Telecommunications Development Program (1992-97)

In line with the ETA's longstanding practice of guiding its development activities via five-year development programs, the Seventh Telecommunications Development Program (STDP) received the government's approval for implementation in the early 1990s. Originally planned for implementation between 1990 and 1994, the STDP was rescheduled for implementation during the period 1992-93 to 1996-97. Implementation actually began in 1993.. Its major objectives were the following:

. to extend basic telecommunications services to as many rural communities as possible;

. to provide telephone connections to as many urban customers as would help narrow the existing demand/supply gap;

. to improve the quality of service by upgrading as many switching offices as was economically viable from manual to automatic operation and maintaining the fault rate at a realistic minimum; and

. to improve the international telecommunications service by increasing direct links to additional countries in keeping with Ethiopia's economic and cultural ties.

To accomplish these objectives, the STDP outlined a number of strategies that included the following steps:

. expanding existing facilities and installing new ones;

- reviewing the organizational structure with a view to adapting it to changing needs;
- improving the quality of service through proper maintenance of plants and proper circuit dimensioning;
- establishing a centralized maintenance workshop to effectively undertake the maintenance of the new generation of equipment and plants; and
- expanding and upgrading the Training Institute so that more extensive and higher level training could be offered.

Under the STDP the total number of telephone stations in Ethiopia, including public call offices and manual and automatic exchanges, was projected to increase from 522 in June 1992 to 672 in June 1997--an increase of 150 new stations (see Table 2.2). The number of stations with automatic exchanges alone was projected to rise from 35 in June 1992 to 58 in 1997. Total exchange capacity was to grow at an average annual rate of 15 percent to reach 340,070 lines in 1997. Most of the projected increase (158,592 lines) would be from automatic exchanges.

2.3.4.1 STDP: International Telephone Service

Table 2.2 Major Targets of the Seventh Telecommunications Development Program

Item	1992-3	1996-97	Growth Rate (%)
Telephone subscription	140,959	248,512	12
Automatic	122,628	233,080	14
Manual	18,331	15,432	-3
Telephone	175,168	309,018	12
Exchange Capacity	165,598	340,070	15
Automatic	141,108	299,700	16
Manual	24,490	40,370	10
Telephone stations	522	672	5
Automatic	35	58	11
Coin Boxes	1,130	2,273	
Telex subcription	1,006	1,605	10

Source: ETA: Seventh Development Program (1992-93 to 1996-97), Vol. II

Using trend analysis, the STDP also assumed that the number of telephone subscribers in Ethiopia would grow at the rate of 12 percent per year. However, because the supply of telecommunications facilities has historically been highly constrained by a number of factors, notably the shortage of foreign exchange,

projecting growth rates on the basis of historical data is far from an accurate way of reflecting the dynamism of the market. The size of the Ethiopia's telephone subscriber waiting list is extremely high (standing in the mid-1990s at 92 percent of total connected lines and growing at 14 percent per year), and at the rate subscriptions were forecast to increase, about seven years would be required just to clear the backlog. It would be a commendable achievement indeed if the STDP succeeded in maintaining the current gap between expressed demand and main line connections.

In the mid-1990s, two standard A earth stations working with the INTELSAT system--a semi- and fully automatic gateway digital telephone exchange and a fully automatic electronic telex exchange--provided international telephone and telex services in Ethiopia. Both satellite and microwave circuits were used for international links, the latter mode being limited to links with neighboring countries. In June 1991, Ethiopia had direct satellite links with seventeen countries. Of these, only one (Ivory Coast) was in Africa, seven were European Economic Community member states, and three were Middle Eastern countries. Over 75 percent of Ethiopia's satellite circuits in 1991 were with France, Italy, Saudi Arabia, the United Kingdom, and the United States.

During the STDP, most of the investment allocated for international service was expected to go toward increasing the number of circuits on existing links. The number of direct telephone circuits was expected to increase from 249 in 1992 to 349 by the end of the program. Direct telecommunications links with Sudan and Somalia, based on microwave radio relay systems, were also planned. In addition, Ethiopia

accounted for two missing links on the PANAFTEL network that Ethiopia and its two neighbors were expected to complete as part of the PANAFTEL Project

2.3.4.2 STDP: Telex Subscription

With the expansion of microwave and UHF links, additional Ethiopian towns were expected to be provided with telex service under the STDP. However, most of the growth in telex connections would result from the addition of subscribers in cities and towns already having telex service. The STDP envisaged a 10 percent annual growth in telex subscriptions.

Ethiopia's international telex service was also expected to show significant growth as a result of the diversification of international links under the STDP. Under the plan, the satellite link that carried the largest volume of international telephone and telex traffic was to be increasingly augmented by microwave and submarine cable links. Since 1991, Ethiopia has acquired circuits on the submarine cable system that links Southeast Asia, the Middle East, and Western Europe (popularly known as SEA-ME-WE). The average annual rate of growth of international telex traffic during the STDP was forecast at 9 percent.

The STDP also included other services such as facsimile and data communication, which although already introduced as public services had not been well developed through the mid-1990s. In addition, mobile telephony, which is not yet part of the services provided by the ETA, was being considered for introduction in the near

future. Facsimile service, which is officially provided by the ETA and unofficially by a few private operators, was expected to be upgraded during the STDP from the current speed standard of one A4-size page every three minutes to one A4-size page per minute. Data communication, which is currently limited to low- and medium-speed transmission on point-to-point leased circuits, was expected to be expanded to include switched data services under the STDP. In the early 1990s, Ethiopia's telex exchange was improved to accommodate data services at 4,800 or 9,600 bits per second.

2.3.4.3 Financing the Seventh Telecommunications Program

In the early 1990s, the ETA estimated that implementation of the STDP would require a total investment of about US$250 million, of which US$170 million would be in foreign exchange. According to the financing plan laid out in the program document, the foreign exchange component of the investment was expected to come from external lending agencies. Since preceding development programs have been financed through external loans, the ETA was optimistic about the possibility of employing a similar mode of financing for the STDP.

The remaining US$80 million, which will be required in local currency, was expected to be drawn from internal resources--for the most part from the ETA's own funds. As laid out in the program's financing plan, the ETA is capable of generating adequate funds from its net earnings and depreciation funds to cover the capital

expenditures required in local currency. Components of capital expenditure in local currency include local purchases, civil works, labor, and other expenses that do not call for importation of goods and services.

The STDP was expected to attract adequate funds from external sources. However, despite the ETA's efforts to secure loans with favorable terms and conditions, by 1994 it had managed to obtain only US$ 64 million from the African Development Bank. There were indications, however, that the other financing institutions involved in past programs, such as IDA, might also once again assist in financing the STDP.

3.0 CURRENT STATUS OF TELECOMMUNICATIONS IN ETHIOPIA

3.1 Services

Major telecommunications services offered by the ETA include telephone, telegraph, telex, and facsimile. Ethiopia's telephone service is by far the most important telecommunications sector service in terms of revenue generation and coverage (see Table 3.1). In 1991, local, long distance, and international telephone services had a combined share of 90 percent of the country's total telecommunications gross revenue. Telegraph and telex together accounted for a mere seven percent of the 1991 revenue. Other services including facsimile had a negligible share of revenue in the early 1990s.

Table 3.1 Revenue and Expenses by Type of Services

(in millions of US Birr)

Item		1985	1987	1989	1990	1991	1992	1993	Annual Growth Rate %
Revenue		105	119	127	152	187	192	215	10
	Urban Telephone	44	52	53	62	71	72	83	8.3
	Interurban & International Telephone	43	48	52	70	97	10	155	14.5
	Telegraph & Telex	14	15	19	17	14	10	12	0
	Others	3.5	3.5	2.9	2.6	5.2	3	3.7	6.8
Expenses**		84	97	111	130	146	148	204	9.7
	Urban Telephone	15.4	19.4	24	30.3	30.5	28	34.6	12.1
	Interurban & International Telephone	11.5	12	15.4	16.9	16.6	16.7	19.1	6.3
	Telegraph & Telex	5.5	5.6	5.4	6.2	6.8	6.4	6.9	3.6
	Others	51	60	67	77	92	97	144	10.3
Net Profit		21	22	16	22	41	44	50	12

Source: ETA: Statistical Bulletins (1989-93); ETA: 40th Annual Report (1991-92)

**Includes profit tax.

The 1992 and 1993 figures do not include those of Eritrea, hence are not included in the growth rate calculations

Ethiopia's local, long distance, and international telephone traffic grew at an average annual rate of 10 percent, 9 percent, and 25 percent, respectively, between 1980 and 1991 (see Table 3.2). Local and long distance telephone services, although more mature than the international services, have more potential for growth, as the huge unsatisfied demand for these services indicates. With the installation of the first

satellite earth station in 1979, the importance of the international service grew. Today, it is the fastest growing service, with two earth stations, microwave links, and a submarine cable used for international services.

Table 3.2 Telephone, Telegraph, and Telex Traffic Trends

Item	1953	1980	1985	1989	1990	1991	1992	1993	Average Annual Growth Rate* %
Telephone traffic									
Local (mn)	10	194	295	312	362	396	424	471	10
Long distance (TH)	190	3428	4318	4644	4364	4427	3000	3700	9
International (mn min.)	-	0.8	2.1	4.7	4.3	8.9	10.1	10.9	25
Telegraph traffic									
Inland (TH)	125	158	252	269	291	257	140	150	2
International									
(outgoing mn)	77	47	17	16	14	13	7	5	-13.2
Telex traffic									
Inland (mn)	-	329	730	1097	1114	860	340	340	9
International (TH min.)	-	563	1057	1121	1020	800	670	570	3

Source: ETA: VIIth Development Program, Vol. II

ETA: Annual Statistical Bulletin (1992/93)

Key : mn = million calls, min = minutes

TH = Thousand

. The 1992 and 1993 figures do not include those of Eriterea, as a result some of the figures show sharp falls.

* Average Annual growth rates have been calculated excluding 1992 and 1993

In Ethiopia in the mid-1990s, the telegraph service, which in the remote past was the only mode of message communication, was no longer a growing industry. While inland telegraph traffic increased at an average annual rate of 10 percent between 1980 and 1987 (followed by a downward slide of 4.6 percent per year between 1987 and 1991), outgoing international telegraph traffic decreased, falling at an average annual rate of 13.2 percent between 1980 and 1991. Ethiopia's telegraph service was expected to become even less significant as the availability of improved telephone, telex, and facsimile services grows.

Telex traffic used to be one of Ethiopia's fastest growing services until internal conflict along the main trunk route linking the capital and the second largest city, Asmara, disrupted services, including all economic and social activities. Between 1980 and 1986 inland and international (outgoing) telex traffic grew at an average annual rate of 18.9 percent and 11.3 percent, respectively. Although both services experienced cyclical patterns in the following years, 1991 was the worst year, with inland and international telex traffic diving by 29.5 percent and 27.5 percent, respectively, from the previous year, mainly as a result of a civil war that engulfed half the country. In May 1991, after years of bloody battles, the former government was forced out and a new interim government formed.

Facsimile service is in its infancy in the Ethiopian telecommunications network. Introduced as a public service in 1988, it had attracted over seven hundred subscribers by 1993 and this figure was increasing at a rapid rate. Although it is too early for a clear growth pattern to have emerged, facsimile service was expected to be an area of rapid growth.

Another recent addition to services provided by the ETA is data communication. With a handful of subscribers served with leased circuits and generating limited data traffic, public data networks are just beginning to be important. Since its introduction in 1987, only low- and medium-speed data transmission service based on point-to-point leased circuits has been provided in Ethiopia. Switched data network service was expected to be provided in
the near future as the demand for connections to such service increased rapidly--20 percent per year in the mid-1990s.

3.2 Network

The Ethiopian telecommunications network consists of an integrated system of cables, manual and automatic exchanges, VHF/UHF and microwave radio relay systems, satellite earth stations, and customer premises equipment.

3.2.1 Telephone Density

The total number of DELs in Ethiopia in June 1993 was 132,000, resulting in a

density of 0.25 DELs per one hundred inhabitants (see Table 3.3). In the same year the total number of telephone apparatuses was 160,000, equivalent to a density of 0.31 telephones per one hundred inhabitants--a very low penetration rate even by African standards. In 1987, the average density of DELs for Africa was 0.76 per one hundred inhabitants.

Table 3.3 Telecommunications Trends: Selected Indicators of Growth

Item	1953	1980	1985	1989	1990	1991	1992	1993	Rate%
Telephone subscription*	4	64	96	116	125	133	127	132	10
Apparatus*	5	86	119	146	156	164	154	160	10
Exchange Capacity*	-	80	124	162	171	176	164	169	7
Telex Subscribers	-	416	670	920	971	1003	880	912	8
Tel. Stations	65	398	476	494	506	512	466	475	6
Waiting Subscribers*	-	-	-	91	109	123	22	141	16
Fax Subscribers	-	-	-	111	233	247	506	745	49
Staff/1000 DEL	-	71	56	50	48	45	43	40	-
Fault/DEL	-	-	-	1.5	1.4	1.3	1.3	1.3	-
DEL/100 Population	-	0.17	0.22	0.23	0.25	0.26	0.25	0.25	-

Source: ETA: Annual Statistical-Bulletins (1990-1993)

*in thousands

*The 1992 & 1993 figures do not include those of Eritrea, hence the sharp drop in 1992.

Of Ethiopia's total 1993 DELs, 89752 or 68 percent were in Addis Ababa, and 3785 or 2.9 percent were located in Diredawa, the second largest city. These two cities together accounted for only 4.5 percent of the country's population and 36 percent of the urban population.

In 1993, there were 475 public telephone stations in Ethiopia--or one telephone station for every 2,341 square kilometers of land surface and over 90,000 rural inhabitants. Because of the nonuniform distribution of these stations, however, there are areas of Ethiopia where one telephone station must cover an area greater than 7,800 square kilometers.

The growth of exchange capacity in Ethiopia is far below the growth of demand for telephone services. In 1993, there were 141,000 registered waiting subscribers--the equivalent of 107 percent of the total connected lines. At the planned connection rate of about 21,000 DELs per year, it will require about seven years just to clear the backlog of registered telephone demand.

3.2.2 Switching Capacity

Exchanges used in Ethiopia's telecommunications network can be categorized into three types: manual, electromechanical, and electronic (digital). In June 1993, of the country's total exchange capacity of 169,000 lines, 16 percent were manual, 46 percent were electromechanical, and 38 percent were digital. The first digital exchanges were

installed during the Sixth Telecommunications Development Program.

3.2.3 Transmission Facilities

The Ethiopian telecommunications network uses a combination of traditional and modern transmission media. Most of the 506 cities and towns with telephone services are interconnected with open wire lines as are all links carrying light traffic between small- to medium-sized towns. The backbone of Ethiopia's long distance transmission system is the 960-channel microwave radio relay system. Secondary routes, far from open wire lines, are served by VHF and UHF systems.

3.2.4 Quality of Service

Faulty equipment, inadequate capacity (resulting in congestion in automatic exchanges and canceling of booked calls in manually switched public offices), and operational inefficiency affect the quality of Ethiopia's telecommunications service. With respect to other African countries, the ETA's network had 1.53 faults per DEL in 1986 according to the ITU, which was lower than the fault rate in nine other African countries. However, this was not necessarily an acceptable fault rate even for a developing country: in 1986, more than ten subsaharan African countries had fault rates per DEL of one or less. In 1993, the ETA reported a fault rate of 1.3 per DEL.

3.2.5 Financial Performance

The 1980s was a period of financial difficulty for many state-owned enterprises (SOEs) in Ethiopia. Some SOEs in the manufacturing sector, for example, reported losses for consecutive years, and others had rates of return below the prevailing interest rate.

Table 3.4 ETA's Financial Performance Indicators

(in millions of Birr)

Average Growth

Description	1975	1980	1985	1989	1990	1991	1992**	Rate %	
1. Revenue	35	48	105	127	152	187	192	215	11
2. Expense*									
(without interest)	27	37	75	95	91	130	132	150	10
3. Net Profit	8	11	30	32	61	57	60	65	13
4. Avg Net Fixed Asset	72	81	133	166	204	229	222	225	7
5. ROR on Asset									
(3/4 x 100) 11	13	23	19	30	25	27	29	-	
6. Current Asset	39	72	137	174	219	211	200	190	11
7. Current Liability	12	41	56	54	56	66	217	236	11
8. Current Ratio (5/6)	3.2	1.8	2.4	3.2	3.9	3.2	.92	0	
9. Total Asset	122	213	282	462	484	567	586	477	10
10. Long-term Debt	29	62	43	186	186	193	161	133	13
11. Net-Asset									
{7-(6+8)}	81	110	183	222	242	163	190	239	8
12. Asset Coverage Ratio									
(9/8)	2.8	1.8	4.2	1.2	1.3	1.4	1.2	1.8	-

Source: ETA: Annual Reports (1990 and 1993) and VIIth Development Program.

* Expense includes profit tax

** The 1992 and 1993 revenue and expense figures do not include those of Eritrea.

The ETA is one of the few SOEs that has registered a reasonable rate of return for consecutive years since 1980. Table 3.4 shows the ETA's financial position since 1975. Its gross revenue grew from Birr 35 million in 1975 to Birr 187 million in 1991, an average growth rate of 11 percent per year. The increase in revenue derived mainly from telephone services, which accounted for 90 percent of gross revenue in 1991. Expenses (excluding interest) increased from Birr 27 million to Birr 130 million in the same period and grew at an average annual rate of 10 percent.

The ETA's average rate of return between 1975 and 1980 stayed at around 13 percent, a couple of percentage points higher than the prevailing interest rate. With the introduction of a new tariff in 1980, the rate of return started to improve, maintaining since 1983 an average annual rate of 20 percent. Table 3.4 also shows two financial ratios that illustrate the ETA's ability to meet its currently maturing debts and to potentially borrow additional funds on a long-term basis.

The liquidity ratio, which had generally stayed over 2 since the mid-1970s, rose sharply beginning in 1985, as a result of the buildup in inventories of investment items at the beginning of the Sixth Telecommunications Development Program.

Since 1987, the ETA's asset coverage ratio has declined rapidly after reaching highs of 4.2 and 3.4 in 1985 and 1986, respectively. This decline was not an

indication of a long-term financial difficulty, however, but a natural byproduct of Ethiopia's development programs: the rise and fall of the asset coverage ratio following the sharp rise of one of the components of the ETA's assets and the phasing out of a long-term debt are cyclical patterns observed around the beginning and end of the development programs.

The ETA has steadily improved its bill collection performance. Collection of sales as a percentage of the collectible amount rose from 72 in 1985 to 80 in 1988. The rather high outstanding balance was mainly caused by bills not settled by government organizations who complained of budgetary constraints.

The ETA is legally expected to contribute to government revenue in a number of ways. These include customs duty and municipal tax on imported goods, income tax, sales tax, capital charge, and residual surplus. Of these, the ETA has dutifully settled only customs duties, income tax, and sales tax. Customs duties amounted to 24 percent of CIF (Assab) until 1992 when it was lowered to 17 percent and income tax to 50 percent of gross profit. Because of the controversy surrounding the government decree (Proclamation No. 163 of 1979 on Public Financial Operations) on payment of capital charge and residual surplus, the ETA's customs and income tax obligations have not yet been fully met. According to this proclamation, the ETA (as well as all public enterprises and financial agencies) is expected to pay the government an annual capital charge amounting to 5 percent of the state capital plus the general reserve fund. According to the Proclamation residual surplus, which amounted to 90 percent of the

ETA's profit after income tax, was also payable to the government annually.

Since August 1992, a new public enterprises proclamation which, among other things, repealed the article on the payment of capital charge and replaced the one regarding payment of residual surplus by payment of state dividend the amount of which will be decided by the owner (Government) has been in place.

While the tug of war was going on between the government trying to enforce the proclamation and the various public agencies trying to resist payment (of residual surplus, in particular) the ETA consistently drew on these funds for its investment requirements, based on government-approved plans. All in all, by the mid-1990s, the ETA had paid to the Ethiopian government Birr 426 million in the form of income tax and capital charge since the mid-1970s--nearly Birr 19 million annually.

3.2.6 Tariff

A major tariff revision for telecommunications services in Ethiopia was made in 1980. This revision brought a new tariff into effect with the following specific changes:

- urban call charges were raised by 50 percent;
- interurban call charges were raised by 15 to 20 percent (20 percent being applied to the lower side of the range);
- subscription and rental rates remained unchanged; and
- international calls were to be based on international and bilateral agreements.

In early 1991, when the government introduced a new sales tax policy, the ETA raised all its charges by 12 percent. The extra revenue from this new tariff, however, actually went to the government. In July 1994 (i.e after fourteen years since the last tariff revision), the Government approved a new tariff structure. The tariff revision focused on telephone subscription installation charges and rentals, domestic telephone and telex calls, and international telephone and telex calls.

The 1994 tariff revision raised:

- urban call charges by 43%;
- international call charges by 75%; and
- subscription chanrges by 165%;

Operator-assisted interurban call charges, however, remained unchanged.

3.2.7 Staff Training

At the time the Imperial Board of Telecommunications of Ethiopia (IBTE) was established it had 642 employees, of whom 96 were expatriates, including the general manager and the high-level trained manpower engaged in administrative, financial, and technical activities. By 1974, however, after years of effort by the ETA and the government, all of the 5,620 employees on IBTE's payroll were Ethiopian nationals.

In addition to the higher institutions of learning Ethiopia has developed over the

years, the Telecommunication Training Institute has played an important role in the development of its telecommunications human resources. The Training Institute, whose activities are broadly divided into preservice and in-service training programs, trained 5,620 staff persons between 1954 and 1991, of which 3,262 were in the technical, 1,930 in the traffic, and 528 in the administrative and financial areas (see table 3.5). Foreign nationals sponsored by their respective employers also attend the regular technician courses offered by the Training Institute.

At the national level, Ethiopia's technological backwardness is partly manifested in a general shortage of trained manpower. The telecommunications subsector may be one of the exceptions, however, in that it has developed adequate institutional capacity to produce the trained manpower required to install, operate, and maintain the system.

Table 3.5 Training by Type of Studies

Training Category	1954	1970	1980	1985	1988	1989	1990	1991
Technician	163	82	95	65	283	325	256	222
Traffic	78	113	102	232	430	208	272	8
Administration	-	59	16	43	291	447	409	615
Total	241	254	254	440	1004	980	937	845

Source: ETA, Statistical Bulletins

4.0 THE FUTURE OF TELECOMMUNICATIONS IN ETHIOPIA

4.1 The Policy Environment: Nationalization and Centralization

Although telecommunications in Ethiopia has been state owned since its inception, state ownership of important manufacturing industries, banks, insurance companies, and many other firms became a priority item following the military's seizure of state power in 1974. Between 1 January and 3 February 1975 alone, all Ethiopian banks, thirteen insurance companies, and seventy-two of the country's largest industrial enterprises were nationalized by government decrees. Since then, only the government has been involved in major investments in the agricultural, industrial, and service sectors. The private sector dominated only small-scale peasant agriculture, small-scale and cottage industries, retail trade, and road transport operations.

State control of economic activities intensified during the following decade and culminated in the launching of a Ten-Year Perspective Plan (TYPP) for the period 1984-85 to 1993-94. The TYPP, which had "Expanding and Strengthening Socialist Production Relations" as one of its major objectives, was to serve as the leading economic policy document in the years that followed. According to this document, all major investments in all sectors were to be the responsibility of the state, and an

increasing share of the country's wholesale and retail trade was to be handled by the state trading organizations.

The total investment envisaged in the TYPP was about US$15 billion, of which agriculture's share was 23 percent. The share of the manufacturing industries and transport and communications was 14 percent each, and telecommunications claimed its fair share of 1.2 percent of total planned investment. The lion's share of the TYPP investment went to the state sector, which accounted for over 90 percent of the total investment.

The TYPP, among other things , highlighted the government's intention to lay the foundation for Ethiopia's electrical and electronics industry. Among the 216 industrial projects planned for implementation during the plan period, five were related to the manufacture of electrical and electronic goods. Radio and television and electric motor and electric bulb factories, among others, were to be established during the plan period.

The other important feature of the TYPP was its strong advocacy for the building of a science and technology capability in Ethiopia. About US$0.6 billion--3.7 percent of total national investment--was allocated in the TYPP for the development of this capability. Policy and institutional measures were also laid down toward the realization of this objective.

In hindsight, it is now clear that the TYPP was too optimistic. During the first seven years of the TYPP's existence (1984-90), only US$4.5 billion worth of

investment out of a total projected gross investment of US$10.5 billion was actually carried out--an implementation rate of only 43 percent. Almost all projects suffered shortages of foreign exchange and other capital inputs.

In those first seven years, the TYPP experienced very weak economic performance due essentially to recurrent drought, war, and inappropriate policy. However, although the poor economic performance during this period was reflected in all sectors of the economy, including telecommunications, the investment performance of the telecommunications sector was far better than the rest of the economy, with 82 percent of the projected investment of the TYPP actually realized.

4.2 Economic Reform

The first major economic reform after the TYPP was the new Economic Reform Program announced by the then ruling party in March 1991. The major elements of this economic reform were the following:

- the promotion of a mixed economy;
- the creation of an appropriate atmosphere for the market mechanism to guide economic decisions;
- active encouragement of the private sector through a series of new incentives;
- reorientation of the public sector management toward competitiveness and profitability;_

- formation of cooperatives on a strictly voluntary basis; and
- greater decentralization of economic decision making.

The most distinct feature of the new economic policy was its intention to move to a market-oriented economy, expanding the role of the private sector and streamlining state-owned enterprises to make them profitable. The implications of these objectives on agriculture, industry, and the service sector were far-reaching. For example, large-scale private commercial farming, which had been totally nonexistent prior to the new economic policy, was expected to attract a large number of investors. Typical incentives offered to investors included exemptions from customs duties and income tax for up to five years.

The new investment code opened up a large number of activities for private entrepreneurs. With the exception of the defense industry, postal and telecommunications services, air, rail and large-scale shipping transport as well as radio and television broadcasting services, all other sectors were, in principle, now open for private investment. [1]

Before the Economic Reform Program could be fully implemented, however, the government was overthrown by the Ethiopian Peoples Revolutionary Democratic Front (EPRDF) in May 1991, which shortly afterward formed Transitional Government of Ethiopia (TGE). The new economic policy announced by the TGE in December 1991 represents Ethiopia's most recent move toward institutional and policy reform at

the national level.

The new economic policy comprises the following general provisions:

1. The state sector will be limited to economic activities which are instrumental in the overall economic and social development of the country and to those areas which, for various reasons, do not attract private capital. More specifically, the state develops the country's economic and social infrastructure, human resources and research institutions; safeguards the well being of society through price stabilization mechanisms; creates an enabling environment for the people, in general, and the private sector, in particular, for their wider participation in development.

2. The private sector will be encouraged to engage in diverse economic activities without limitations on the amount of capital to be employed.

3. All laws and policies, including investment, tax and labor laws as well as monetary, credit and interest policies will be revised to the extent that they facilitate the implementation of the new economic policy.

In addition to these general provisions, the new policy stated the following with respect to communications:

Since of the role of telecommunications and postal service as essential public services, these services will remain under state ownership. However, the possibility of private sector participation will be explored and appropriate policies and regulations will be issued to that effect. According to the new economic policy, the role of

Ethiopia's private sector in the telecommunications sector was to be defined later. From the preceding quotation, however, it can be surmised that Ethiopia's basic telecommunications services are unlikely to be open in the future for private sector competition.

4.3 Liberalization of Telecommunications Services

Since the beginning of 1991, the ETA has relaxed some aspects of its long-held monopoly position. For the first time in its history, the ETA issued a policy that allows subscribers to operate their own facsimile equipment on the ETA's network. This policy further stipulated that the private sector could import facsimile machines that meet the ETA's specifications as well as distribute them to subscribers.

This move was the beginning of a new liberal policy toward private sector participation in the provision of Ethiopia's telecommunications services. Although the facsimile terminal equipment was the only telecommunications facility open to private ownership and distribution in the mid-1990s, telephone equipment, teleprinters, data modems, PABXs, and the like were also possible candidates for the liberalization policy.[2]

In 1990, the ETA was encouraged by the government's announcement of a new economic reform program that provided for increased participation by the private sector in many sectors of the economy . Historically, the growth of Ethiopia's telecommunications services has been seriously hampered by the shortage of facilities,

from customer terminal equipment to exchange capacity. The emerging trend of encouraging private participation in the provision of terminal facilities will therefore undoubtedly ease some of the burden carried by the ETA.

In order to increase the significance of the liberalization policy, the ETA will first have to allow wider private participation to cover at least the telephone apparatus and teleprinters. Second, private participation will have to be extended to cover the provision of certain telecommunications services on value-added networks (VANs). The areas of data communication and information may also be included in the list of services for private sector participation.

5.0 CONCLUSION

Telecommunications in Ethiopia is almost as old as the technology of electrical communication itself. Ethiopia adopted telephone technology fairly quickly and in the early days of its telecommunications development it was not very far behind the rest of the world. The first long distance telephone line in the world was installed between Boston and New York in 1885, it was only nine years later that Ethiopia's long distance telephone line between Addis Ababa and Harar (spanning 480 kilometers) became operational.

The development of Ethiopia's telecommunications should be assessed primarily in relation to the overall economic and social development of the country; The political environment, national development policies, and socioeconomic order

have influenced the growth of the telecom sector. Despite the resource and policy constraints that the telecommunications sector has endured in the past, there has been progress. Ethiopia has a relatively efficient telecommunications services sector, affordable to several thousand citizens and a telecommunications administration run by an adequately trained, all-Ethiopian staff.

On the other hand, the telecommunications sector is characterized by very low telephone accessibility and penetration rates--even by African standards. The number of registered waiting subscribers reached 87 percent of the total actual number of connected subscribers in 1990--and in early 1995, the figure was still climbing. While the rural service suffers from a shortage of physical facilities, which is characteristic of the network as a whole, the low financial returns in rural areas is an additional obstacle to the existence of service throughout the country.

From the analysis of this chapter, it is clear that the most critical issue facing Ethiopia's telecommunications today is the huge gap between the demand for the most basic telecommunications service and the existing capacity. Other problems of increasing importance include quality of service and the demand for new services. The provision of efficient, adequate, and reliable telecommunications services requires the availability of adequate resources--financial, human, and material. But the most serious resource shortage is finance, particularly foreign exchange. This constraint stems from Ethiopia's inability to expand its export base and, in reference to telecommunications, from the absence of a domestic capability for manufacturing telecommunications

equipment.

Overcoming the constraints described in this chapter is a prerequisite for modernizing Ethiopia's telecommunications network and extending services to the rural areas. This will be a protracted process, calling for a short-term measure for removing immediate hurdles and a long-term plan that takes into account the need for a sustainable development of local telecommunications manufacturing capabilities.

5.1 Future Demand for Telecommunications Services

Even before the Ethiopian government's economic reform of the early 1990s, the growth in demand for both traditional and new telecommunications services was extraordinary. But the increasing number of waiting subscribers is only one indicator of the magnitude of the demand for that basic communication facility--the telephone. The opening up of Ethiopia's economy through increased private sector participation in all sectors and in the service sector in particular, will, undoubtedly, bring about more dramatic changes in the magnitude and structure of demand for telecommunications services.

In addition to basic telephone service, significant increases in the demand for data communication and information services as well as for telecommunication services for entertainment (such as cable TV) is expected in the short to medium term. Moreover, the ETA has been approached by some customers requesting new services such as packet-switched data communication, faster facsimile and mobile telephone.

Demands from the public are not limited to the provision of new services by the ETA itself, however, but also include requests for relaxation of the ETA's monopoly right in such areas as importation of customer premises equipment.

In summary, the vitality of Ethiopia's telecommunications sector will depend on the effectiveness and clarity of the government's economic policy in general and its telecommunications policy in particular as well as on the responses of the private sector and all other parties concerned with the development of the country's telecommunications.

5.2 Future Telecommunications Policy

5.2.1 The Role of the Private Sector in Services and Manufacturing

In early 1995, the government's policy maintains that telecommunications is a public utility that should remain under state ownership, with the provision that some aspects of the service may be opened to private participation in the future. Wholesale privatization or some similar measure may not serve the country's long-term interests, however. On the one hand, there is the need for an adequate, reliable, and modern telecommunications network and, on the other, the ever nagging aspiration to develop the capability to manufacture telecommunications equipment locally. The policy that should evolve must ensure, for the short term, the influx of private capital needed to compensate for the shortfall in public investment for the improvement and expansion of telecommunications services and, for the long term, the development of a

telecommunications equipment manufacturing capability.

The role of the private sector in the provision of Ethiopia's telecommunications services must be clearly defined. Private sector participation may be limited in the beginning to the terminal equipment market and value-added networks and then gradually move to areas currently known as basic telecommunications services. Such a move might be seen as an

infringement of the ETA's long cherished monopoly right and as a loss of an important revenue source for the government. But at the same time it should come as a relief to the ETA to be spared the massive burden of being the sole satisfier of customer demand--a responsibility the ETA alone can never hope to fulfill in the near future. With respect to government revenue, the potential tax revenue from the private sector should be more than able to offset the loss of revenue that will result when the private sector takes over some of the ETA's line of activity.

The new government economic policy of the early 1990s provided for wider private sector participation in the manufacturing sector. Only heavy engineering and metal industries as well as plants producing basic drugs, fertilizers, and chemicals are singled out for state ownership. From this, it appears that electronics industries in general and telecommunications equipment manufacturing in particular are now open to the private sector. Even so, the new economic policy is only a broad guideline that should be translated into concrete laws and regulations to be meaningful for the private sector.

To develop Ethiopia's electronics industry, which should start almost from scratch, a policy of active promotion should be employed. Modern telecommunications equipment manufacturing is knowledge-intensive, and as such it requires the close collaboration of foreign investors who can bring in both technology and capital. This will require an appropriate incentive mechanism for attracting foreign investors.

5.2.1 Restructuring the ETA

Regardless of whether the private sector's entry into the telecommunications sector is instituted or not, the ETA will remain the most important carrier in Ethiopia's telecommunications industry. Serious thought should therefore be given to the periodical review of the organizational structure of the ETA with a view to meeting the challenges of the future.

If the private sector is to have an increasingly significant role both as a provider of telecommunications services and as a supplier of equipment, the role of the ETA must be redefined. The ETA's current regulatory function combined with its role as a provider of telecommunications services can only be acceptable in a monopoly situation. Given the government's intended liberalization policy, a new structure that separates regulatory powers from commercial roles will therefore be necessary.

Having defined the roles of the ETA vis-α-vis the telecommunications industry as a whole, the other crucial aspect to be considered is management of the ETA itself. During the first two decades of its existence, the ETA enjoyed a certain degree of

autonomy: its board of directors determined its annual capital expenditures, appointed the general manager, and so forth. However, following the nationalization drive of the previous government, the management autonomy of the ETA, along with all other SOEs, had been drastically curtailed. Until a new enterprise law issued in 1992 paved the way for hundreds of SOEs to be run on commercial principles.

Future restructuring of the ETA should therefore at least restore the level of management autonomy that prevailed in its early years. Finally, the tariff issue is another important element related to the question of the ETA's autonomy: setting tariffs may remain the responsibility of the government, but an efficient tariff revision mechanism should be established nonetheless.

5.3 CONCLUSION

Telecommunications in Ethiopia is almost as old as the technology of electrical communication itself. Ethiopia adopted telephone technology fairly quickly and in the early days of its telecommunications development it was not very far behind the rest of the world. The first long distance telephone line in the world was installed between Boston and New York in 1885, it was only nine years later that Ethiopia's long distance telephone line between Addis Ababa and Harar (spanning 480 kilometers) became operational.

The development of Ethiopia's telecommunications should be assessed primarily in relation to the overall economic and social development of the country;

the history of Ethiopia's telecommunications, one can observe how the political environment, national development policies, and socioeconomic order have influenced the growth of the telecommunications sector. Despite the resource and policy constraints that the telecommunications sector has endured in the past, there has been considerable progress. Ethiopia has a relatively efficient telecommunications services sector, affordable to several thousand citizens and a telecommunications administration run by an adequately trained, all-Ethiopian staff.

On the other hand, the telecommunications sector is characterized by very low telephone accessibility and penetration rates -- even by African standards. The number of registered waiting subscribers reached 87 percent of the total actual number of connected subscribers in 1990--and in early 1995, the figure was still climbing. While the rural service suffers from a shortage of physical facilities, which is characteristic of the network as a whole, the low financial returns in rural areas is additional obstacle to the exstension of service throughout the country.

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stems from Ethiopia's inability to expand its export base and, in reference to telecommunications, from the absence of a domestic capability for manufacturing telecommunications equipment.

Overcoming the constraints described in this chapter is a prerequisite for modernizing Ethiopia's telecommunications network and extending services to the rural areas. This will be a protracted process, calling for a short-term measure for removing immediate hurdles and a long-term plan that takes into account the need for a sustainable development of local telecommunications manufacturing capabilities.

References

1. Alemayehu Kibret, Price policy and Revenue Effectiveness of Tariff Rutts in the Ethiopian Telecommunication Authority Ethiopia: A.A. 1985

2. Asfaw, Fikru, Management of Telecommunications In Ethiopia, African Telecommunication Development conference (ATDC) Zimbabwe: Harare, 1990

3. ITU, African Telecommunication Statistics. ATDC, Zimbabwe: Harare, 1990

4. Eshete, Aleme, The construction of Italo-Ethiopia Telephone and Telegraph line 1898-1974, Ethiopia: A.A

5. ETA, Telecommunications Development Programs

6. Ethiopian Science and Technology Commission, Working Papers presented to the First National Conference on Science and Technology Policy of Ethiopian. June 20 - 25, 1988 A.A.

7. ----- Policy consideration on Licensing of Private Customer - Premises - Equipment for Accessing ETA's Networks. March 1990 (Rev. 2)

8. Lee, William, From Bush Telegraphy to Microwave system: Telecommunication in Ethiopia 1897-1973, Ethiopia: A.A 1973

9. Lemma, Taye, Price of Telecommunication service in Ethiopia. Ethiopia: A.A. 1987

10. Ministry of Post, Telegraph and Telephone; Telephone service in the Eritrea Province 1953-1963: Asmara II Pilgraphics 1969.

11. Niswonger, C. Rollin et al, Accounting Principles, 12th Edition. USA. South-Western Publishing Co. 1970

12. Office of the National Committee for Central Planning of Ethiopia, National Workshop on Population Policy Development, June 12 - 13 1990 A.A

13. ------- Ten Year Perspective Plan (1984-85-1993-94) Ethiopia A.A

14. Pankhurest, Rechard, Transport and Communication in Ethiopia 1835-1938; The Journal of Transport History 1975, Vol. 2.

15. Seyed Mohammed, Notes on Financial Analysis for Project (unpublished), Ethiopia: A.A, 1986

16. Transitional Government of Ethiopia, Economic Policy of the Transitional Government of Ethiopia, Ethiopia: A.A. 1990

17. UNECA, Programme of the second United Nations Transport and Communications Decade in Africa, 1991-2000.

18. WB, Ethiopia's Economy in the 1980's and Framework for Accelerated Growth, No 8062-ET., March, 1990

19. -----, World Development Report, 1983-1989.

1. However, the code stated that "Investments in the provision of electric light and power, processing of tobacco, banking and insurance, and the supply of potable water activities shall require the prior authorization of the Council of Ministers."

2. In early 1995, a decision on the further liberalization of the CPE market was pending.