

Telecommunications
Restructuring in Africa: An
Economic Appraisal and
Country Case Studies

by Paul Nomba Um

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Columbia Institute for Tele-Information
Graduate School of Business
Columbia University
809 Uris Hall
New York, NY 10027
(212)854-4222

TELECOMMUNICATIONS RESTRUCTURING IN AFRICA:**An Economic appraisal and COUNTRY CASE STUDIES****Paul Noumba Um****1.0 INTRODUCTION: GENERAL BACKGROUND**

To understand the basic problems affecting the development of telecommunications in Africa, an analysis based on the three stages outlined in the following sections is necessary.

1.1 Main Stages of Analysis**1.1.1 Stage One**

It is important to understand that the construction of the first telecommunications networks began later in Africa than anywhere else in the world. For example, when the first submarine telegraph cables reached Asia in the mid-eighteenth century, domestic telegraph networks were already in service there (Headrick, 1991) while in Africa, the first submarine cables reached the continent years before the first inland networks were built (there were exceptions in North and South Africa). In Africa, the development of telecommunications networks was imposed by colonial authorities to improve the communications links between the territories and the metropolises. It is quite clear that

with the achievement of political independence in the 1950s and 1960s, African countries inherited obsolete and undeveloped networks. Meanwhile, some countries in Asia, which also inherited obsolete or under-developed telecommunications, have successfully engaged in the modernisation and expansion of their telephone networks (Malaysia for example). Therefore, explaining the current situation of telecommunications in Africa, one can't neglect the fact that the whole development process hasn't yet taken off. The main reasons have been so far more political. That is, the one party system which has operated in Africa since the sixties failed to design an appropriate incentives scheme which should have lead to economic development in general, and telecommunications expansion in particular.

1.1.2 Stage Two

The second stage in the development of Africa s telecommunications networks began in the 1960s when the newly independent states, with the assistance of the International Telecommunications Union (ITU) and other multilateral organizations, became involved in the modernization of the national networks. In this stage, the main task was to convince political leaders that investing in the telecommunications sector could also foster the economic development of the country (Bebbee-Gilling, 1976;

Hudson et al., 1979; etc.). In 1963, Jipp published his famous paper that clearly demonstrated the close links between a country's economic development (gross domestic product or GDP per inhabitant) and its telephone penetration rate. Investments in the telecommunications sector in Africa began receiving more attention from the planning authorities, but these efforts were constrained by the limited resources at the disposal of the governments.

1.1.3 Stage Three

The third stage began in the early 1980s. Despite their development efforts, African countries had achieved a penetration rate of only 0.6 main lines per one hundred inhabitants. More importantly, however, telecommunications networks were poorly managed and were used obsolete equipment. This period was also characterized by huge economic and financial burdens, as well as, drought in some countries. In the early 1980s, a growing deregulation movement, which began in the United States dominated the telecommunications sector. African countries then began progressively admitting that the direct involvement of government in the operation of the telecommunications networks, as in other industrial fields, was not efficient and had to be limited. Under pressures exerted by the World Bank and the International Monetary Fund (IMF), the first

structural adjustment programs were adopted. The first restructuring plans of Africa's telecommunications sector followed.

1.2 Background: Telecommunications

By 1991, telephone penetration rate in Africa was estimated at 1.4 main lines per one hundred inhabitants. This ratio varied from less than 0.4 line in most subSaharan countries to more than 3 main lines in North and South Africa. These differences must be kept in mind when analyzing telecommunications in Africa. In the case studies that follow, the analysis is limited to the telecommunications situation of some subSaharan countries.

Penetration rates by the year 2000 are projected to be around three main lines per one hundred inhabitants for Africa. To achieve this objective, African countries will need US\$40 billion of new investments in the telecommunications sector (see tables ??, ?? in appendix ??) and will have to reorganize their sectors in order to cope with a projected annual growth rate of 15 percent. How can such a target be achieved? There may be multiple answers to this question, but because the process of achieving these goals is expected to entail many shortcomings, the following points should serve as guidelines to any serious reform:

- national economies, even those in Africa, are increasingly interdependent on one another and increasingly dependent on what is known as "market globalization";
- the rapid changes in telecommunications technology have direct effects on the planning and operation of telecommunications networks, even in Africa;
- the now well-known notion of deregulation has taken roots in Africa, as elsewhere. Subsequently, how long can a monopoly in the teleservices area in Africa be maintained? In industrialized countries, the nationwide development of the telecommunications network has been carried out first: universal service objectives have been achieved before deregulation or even divestiture of PTOs was decided on. Is it possible for monopolists to prevail in Africa in such a globalizing context?
- to cope with the projected investment figures referred to above (US\$40 billion in new investments), some of the following questions still need to be answered:
 - (a) from which sources (private, public) can African governments acquire these funds?
 - (b) if, as is already accepted by most experts (Wellenius, 1993; Stone, 1993; etc.), public funds can no longer cover the needs of network expansion, which directions should African governments follow in restructuring their telecommunications sectors?

Meeting in Harare, Zimbabwe, in December 1990, African telecommunications ministers agreed on the necessity for general restructuring of the telecommunications sector throughout the continent. They also envisaged the opportunity for private investors to become progressively involved in the sector. However, because of its nature as a natural monopoly, the telecommunications sector in Africa has historically been considered as a strategic sector that should be controlled directly or indirectly by the government (J. S. Stuart Mill, A. E. Kahn, 1971; Berg Sanford et al., 1990; Baumol et al., 1982; etc.). Moreover, in Africa, the telecommunications sector was considered as a strategic sector above all because it was an important means of maintaining national sovereignty, especially with respect to state security.¹ It is for this reason, as the following case studies make clear, that African reforms in the telecommunications sector are not yet as liberal as the reforms undertaken in Latin America or by British Telecom in 1984.

Since 1985--the year Senegal decided to transform the PTT (Post, Telegraphy, & Telecommunications) Administration into a public company under the private law registration--many telecommunications reforms have been carried out or initiated. Some of the most successful occurred in Gambia, Burkina Faso, Equatorial Guinea, Central Africa Republic,

and, more recently, in Guinea, Rwanda (see chapter), Madagascar, and Mali. What is noteworthy in these experiences is that the final step leading to privatization was for most of these countries a difficult and delayed process.

Until the end of 1993, Rwanda², Guinea, and Madagascar represented the only cases where a privatization scheme was officially considered and auction processes elaborated. In some countries, such as Mali, Central Africa Republic, and Equatorial Guinea, a private shareholder (namely, France Câbles & Radio) controls the newly created network operator together with the government (see table 1.1).

Table 1.1 Telecommunications Reform in Selected Regions

Regions	Realized reforms	Reforms underway
Latin America (region of privatization operations)	Chile (1987), Peru (1994), Argentina (1990), Mexico (1990), Venezuela (1991), Jamaica (1987)	Bolivia, Ecuador, Panama, Brazil, Uruguay, Honduras

Asia (region of corporatizations and BOT contracts)	Malaysia (1990), Indonesia (1990), Sri Lanka (1990), Thailand (1993), Singapore (1994)	India, Pakistan, Taiwan, Korea
Africa (region of corporatizations and light privatizations)	Guinea (1995), Madagascar (1994), Equatorial Guinea (1989), Central African Republic (1989), Gambia (1984), Mali (1990), Senegal (1985), BURkina Faso (1987), Nigeria (1985).	Kenya, Zimbabwe, Cameroon, Sudan, Congo, Tunisia, Morocco, Ghana, Bissau Guinea

Source: Telecom Bretagne, Economics Department.

The restructurings of Africa's telecommunications sector in the mid-1990s were usually sponsored by the World Bank and followed the design of the European Green Paper (1987). In the following sections, we discuss some of the major issues involved in these reforms, focusing first on the principal players.

1.3 Main Actors in Telecommunications Restructuring

The telecommunications restructuring programs in Africa in the mid-1990s involved interactions between at least five major groups of actors: development banks, the International Monetary Fund, users of teleservices, workers of the PTT, and government.

1.3.1 Development Banks

One of the most important players in Africa's telecommunications restructuring efforts are the development banks and in particular the World Bank, which is the leading institution in most of the programs underway in sub-Saharan Africa in the mid-1990s. In the past, the Bank has been mainly involved in financing new plant investments (switching exchanges, transmission links, and the like). At the beginning of 1980, however, the Bank began its major adjustment programs in most African countries. Although the main thrust of these programs did not include telecommunications issues, it became clear that this sector could no longer be ignored. Since then, the Bank has financed most of the first stages of the restructuring programs, providing loans to finance the corporatization of public telecommunications operators (see #.# and #.# on Guinea and Cameroon, respectively). The Bank has also been trying, with little success, to introduce more competition

in Africa's telecommunications sector. Until now, however, only a few African countries have really designed a "liberal" regulatory framework for the sector.

In the category of development banks, many other foreign organizations such as KfW (Germany), Cfd (France), and USAID (United States) have also been active. In 1990, for example, the USAID tried to promote the realization of exports processing zones in Cameroon and Togo, but these projects failed because of political instability. The purpose of these projects was to induce American companies involved in data processing technologies to settle in Africa, requiring telecommunications facilities and arrangements interconnections. The Cfd in France is also involved in many restructuring programs in Africa. The transfer in 1994 of 49 percent of the stock of Stelmad (Madagascar's new telecommunications operator), a subsidiary of France Telecom, was accompanied by a loan from the Cfd covering the investment requirements for the first two years.

1.3.2 International Monetary Fund

Because of its great involvement in Africa's adjustment programs, the International Monetary Fund (IMF) is also one of the main actors in the continent's telecommunications restructuring programs. Since 1985, the IMF has recommended

that the sector be given more autonomy and be liberalized in order to attract private investments.

1.3.3 Teleservices Users

Users of teleservices, mainly business subscribers such as banks and insurance companies, should be playing an important role in the design of the new telecommunications framework. From the evidence, however, users groups do not really exist in most African countries. One reason may be that because democracy is still in its infancy stage in Africa, users groups cannot perform their function. Another may be that as a result of Africa's low teleservices penetration rate business and individual users do not consider telecommunications to be very necessary for them.

1.3.4 Telecommunications Workers

The workers of the PTT are generally civil servants, and it is often said that they are not as efficient as workers in the private sector, i.e., the "burdening bureaucracy". Nevertheless, in some of the countries we have analyzed, workers trade unions were in favor of restructuring (see 2.5 on the Congo, for example). Still, the role played until now by trade unions in Africa has been a less active one than that played by their counterparts in such regions as Latin America.

1.3.5 Government

The most important player in Africa's restructuring efforts is the government. Restructuring must be viewed as a Stackelberg process wherein the government is responsible for the whole process from its beginning to its final stage. Therefore, if the political will is not consistent (see 2.11 on Cameroon, for example), the whole process cannot evolve efficiently. The commitment of the government is essential for any restructuring to get underway, but pressures exerted by organized interest groups (users, business users, and the like) can accelerate the process. On the whole, the restructuring of Africa's telecommunications sector has been accomplished more often by creating incentives for the public telephone companies to achieve greater autonomy than by incentives toward enhancing competition.

1.4 Liberalization Trends

The problems in developing countries like in Africa are twofold: the inefficiency of state monopolies and the lack of financial means to expand and develop public networks. Therefore, more liberalisation in the telecommunications sector implies a clear market organisation, also meaning that governments should have to specify the duties and rights of the different actors (manufacturers, network operator, regulator, user group, etc.). Liberalising the

sector is then scheduled to lead to more opportunities in attracting private investors. The small base of telephones in most sub Saharan countries means that divestiture is, at best, a partial solution to fostering more private investment in the sector. More important than the "top down" approach may be various "bottom up" approaches to private sector development³. But, this point doesn't say that more liberalism will miraculously improve the situation in Africa.

The different points raised above seem to be very consistent concerning the telecommunications sector in sub Saharan countries. It's well established throughout the economic literature (NOAM 1988 or 1991, D. ALLEN 1988, etc.), that as the number of telephone subscribers remain below the critical mass, the network expansion need to be subsidized. Further, recent history in network development has shown that, in most developed countries universal service was admitted as the paramount objective to be achieved by PTO's, therefore monopolist structures were accepted almost in every country. Though, competition survived at the periphery in some countries (USA, Denmark, Sweden, Finland), it's quite clear that, the main objective in these countries was, first to provide a telephone access to any citizen despite its localisation or revenue. Liberalisation has then been put forward progressively with the completion of this basic

objective.

The second main issue is that, the world-wide globalization of national economies would not enable developing countries to address the questions raised by the "universal service" target as developed countries did, during the past thirty years. New solutions are required, both in the financial area as in the management of the "public" network. For such an agenda to become operational, there is a difficult task of coordination and designing adequate regulatory framework. Let us give the following two examples, to make our statement clear:

In many African countries, experiences are carried by PTO's to enhance the "private provision" of telephone booths or "private call offices" in rural and urban areas. While travelling across Africa, one could easily note that, there is a shortage in the supply of calling booths. In Cameroon, Tunisia, South Africa and Senegal to name these few examples, Public network operators have encouraged private investors in a kind of a franchising scheme to operate telephone booths in areas which were previously, not served or underserved. Stavrou (1991) pointed out the successes of such an experience in South Africa and emphasized in the important social role then played by these calling offices.

A second example is provided by the different incentives developed by government toward the emergence of

local providers of engineering service in telecommunications such as cables installation and repair, microwave towers, maintenance of telephone cables networks, etc. In Tunisia, Senegal, Kenya, these experiences are proving interesting results.

The liberalization of Africa's telecommunications sector can be assessed by analyzing the five major segments of the telecommunications market: international voice service, cellular service, telephone sets and terminals, network infrastructure, and telecommunications manufacturing (ITU/BDT questionnaire, 1994). Before discussing liberalization trends as reflected in these segments, however, it is important to characterize the tariff structures of the countries analyzed in the case studies later in this chapter.

1.4.1 Tariff Structure

Table #.# shows the major types of telecommunications tariffs of some of the countries analyzed in this chapter's case studies (see #.#). It is clear that although Africa's network is still in its emergent stage, access charges to the network are relatively high compared to the per capita GDP--at about 14 percent (with the exception of Cameroon). Tariff rebalancing is thus needed almost everywhere. However, in Africa, because of the lack of statistics or

proper accounts, the attempt to rebalance tariffs is a complex task (see Noumba, 1991). In Cameroon, for example, it was decided that for political reasons tariffs should be lowered to make possible more connections to the network. Unfortunately, bottlenecks in management hampered this effort.

According to the ITU (1994), the average installation fee for residential subscribers is estimated to be around US\$93.80 in Africa while the monthly subscription rate is around US\$4.70. For business subscribers, the rates were US\$92.30 and US\$5.60, respectively.⁴ Compared to Europe, Asia, or North America, teleservices tariffs in Africa are very expensive especially for residential subscribers who cannot afford the high prices (see table #.#).

Tariffs are a basic tool used in the planning and management of the telecommunications network. Tariffs, for example, may be set high in order to regulate a rapid growth in demand that the operator cannot keep up with. On the other hand, high tariffs can be socially counterproductive because many potential subscribers are prevented from joining the network. In developing regions such as Africa, however, potential subscribers are prepared to pay higher tariffs, if they can be provided good access to the network. Tariff rebalancing may be imperative, but has to be carried progressively.

Cross-subsidies were not yet a very important issue in Africa in the mid-1990's, because of the monopoly context that prevailed in the telecommunications sector. Cross-subsidies are positive factors because they are seen as necessary for achieving the goal of universal service. However, the critical issue is: what social categories truly benefit from these subsidies ?

1.4.2 International Voice Service

In the past, Africa's international gateways were often franchised to mixed economy type corporations owned jointly by the government and some transcontinental operators (such as Cable & Wireless, France Câbles & Radio, and ITT). Since the beginning of the 1980s, some African governments have merged both segments of the telecommunications network into one state owned corporation. Despite minor liberalizing measures on the provision of VSAT (Very Small Aperture Terminal) equipment to connect to the Inmarsat or even the Intelsat systems, the restructuring underway in the telecommunications sector in the mid-1990s has not induced more competition in the international voice segment.

1.4.3 Cellular Service

Cellular service in Africa began within the framework of the telephone monopoly. According to an ITU survey, by the mid

of 1992, five countries had already authorized competition, two had ordered partial competition, and twenty other countries kept cellular service under the telephone monopoly. The reasons are the following:

It's now well established that public funds can no longer satisfy the huge investments needed in expanding telephone access in Africa. If for strategic reasons, governmentsw have to play a direct role over what is called fixed service, we think that wireless services should be handed over to private concerns. First, wireless services can be supplied by different operators interconnecting their sub-networks to the fixed telephone network. Second, professional subscribers that are unsatisfied by the quality of basic telephone's service, should switch to cellular network and pay higher tariffs which can be used to subsidize basic telephone for rural areas. Third, interconnection charges collected by the telephone network operator can also finance the modernisation and expansion of the basic telephone service. It's also well known that rolling out a cellular network is quite easy and only requires a few months to be operational (See for example, what the Bond's Corporation did in Chile in 1988).

The supply of cellular service need a new regulatory framework which address the following issues:
interconnections, compatibility, standards, spectrum

management, the issuing of franchise licenses (by type of service, spatially, etc.) .

Although wireless communications could enhance teleservices penetration in Africa, by the mid of 1992 little had been done to design an appropriate regulatory framework for that purpose.

1.4.4 Telephone Sets and Terminals

Few African countries have kept their terminal markets within the scope of the old PTT monopoly. According to the ITU survey mentioned in the previous section, thirteen countries had totally liberalized this segment by the mid of 1992, five countries had adopted a partially competitive framework, and only nine countries had maintained the status quo. Almost everywhere, facsimile terminals and other telephone or data terminals are supplied within a competitive framework, even in countries that have retained the monopoly framework. In some countries like Cameroon, the PTT has liberalized the terminal market since the 1960s. The public operator meanwhile has the right to decide on terminal technical agreements and supplies one telephone set with any new connection.

1.4.5 Network Infrastructure

Historically, Africa s telecommunications infrastructure

(the public network), which provides basic services such as telephone, telegraphy, telex, or even data communications, has remained within a monopoly framework. No particular competition has yet emerged. The African Green Paper published in 1993 called for increased association of private investors through schemes like BOT (Build Operate Transfer) and BLT (Build Lease Transfer) and, in response to the proposals of the "Missing Link" report of 1984, recommended that incentives be implemented to induce the development of a manufacturing sector in Africa.

Antonelli (1991) has shown that because of their low penetration rates (the network's "infancy" stage) developing countries can leapfrog through levels of technology by investing massively in the expansion of their networks. From this point, it could be argued that governments could provide private investors with incentives through a commitment scheme toward real liberalization of the sector. However, in attracting investment in manufacturing facilities does not necessitate the end of competition in the procurement of network equipment. For the sub-Saharan countries, it seems necessary to both improve the efficiency of the management (cut investment costs back toward the international standard) and induce more investment in the expansion of the network.

1.4.6 Telecommunications Manufacturing

In Africa in the mid-1990s, there were at least nine different types of digital exchanges within the public networks. According to figures published by a 1992 study by Pyramid Inc., the submarket in Africa was shared by the following systems: E10 (406,000 ports), S12 (865,000 ports), 5 ESS (60,000 ports), Fetex-150 (23,000 ports), Axe (192,234 ports), Neax 61 (117,527 ports), DMS (882,000 ports), EWSD (1,506,283 ports), and OTH (1,170,500 ports). Based on these figures, the most important providers in the region (which also included Algeria, Egypt, Morocco, Tunisia, and South Africa) were Alcatel with its E10 and S12 systems and Siemens. Siemens has been the most successful provider in the region since 1989, and it entered Cameroon's market successfully by selling ten digital exchanges with a capacity of about 90,000 main lines. If the installed digital base in Africa and the Middle East is considered, however, Alcatel has a major advantage (6,700,000 main lines compared to Siemens's 4,400,000) within the French-speaking countries. Both Alcatel and Siemens were developing local manufacturing facilities in the region in the mid-1990s (for Algeria, Morocco, and Tunisia, see chapter ; for Egypt, see chapter ; and for South Africa, see chapters and).

Compared to other regions, Africa plays only a minor role in the world telecommunications equipment market,

accounting for only \$US 46.2 million of the world s \$US62.522 billion telecommunications equipment export market and only US\$1.239 billion of the world s US\$63 billion telecommunications equipment import market. Although some multinationals have created subsidiaries in Africa, technology transfer has not yet progressed very far on the continent. South Africa, Tunisia, Egypt, and Algeria have manufacturing facilities that have yet to be developed. The basic problem plaguing African countries is that from a business perspective they do not usually represent lucrative markets⁵.

Given the plans to expand the telecommunications networks throughout the continent (about 12,282,000 additional main lines to be added up to the year 2000), local producing facilities must now be envisaged. For the turn-of-the-century goals to be realized, the planning process within the PTO must be updated and the efficiency of management improved. The question is now: can Africa carry out technology transfer programs like Brazil (Tropico), Korea (TDX), or India (Cdot)?

Of the subsidiaries of the major equipment suppliers operating in Africa, there exists a number of local manufacturers (mainly medium-scale enterprises) that are maintaining operations related to telecommunications: battery cell units, consumer electronics, electric cables,

mechanics, duct equipment, and so on. All of these businesses can be developed through internal or external growth toward a consolidation of manufacturing activity in telecommunications, transmission, outside plants, or software.

2.0 Case Studies

Each country case study presented in the following sections provides, first, an introductory description of the country and a concise history of its telecommunications network; second, a discussion of the present state of its telecommunications sector with an emphasis on the forces driving the restructuring program. The following issues will be discussed:

How the restructuring was handled; what its goals and achievements were, and what difficulties it encountered; and, a treatment of the major trends for the future. Since every restructuring case is unique, we have avoided the attempt to draw general, abstract conclusions.

2.1 Madagascar

The island of Madagascar covers an area of 587,041 square miles with a population of 11,500,000 inhabitants. The population of Antananarivo, the national capital, is estimated at 800,000. Madagascar is ranked among the

world's poorest countries (see table 2.1.1), and since its independence in June 1960, it has experienced three different political systems. Since 1991, Madagascar has had a democratic political system.

1993	Percentage of active population	Percentage of GDP
Agriculture	75	41
Mines	1	1
Industries	9	20
Services	15	38

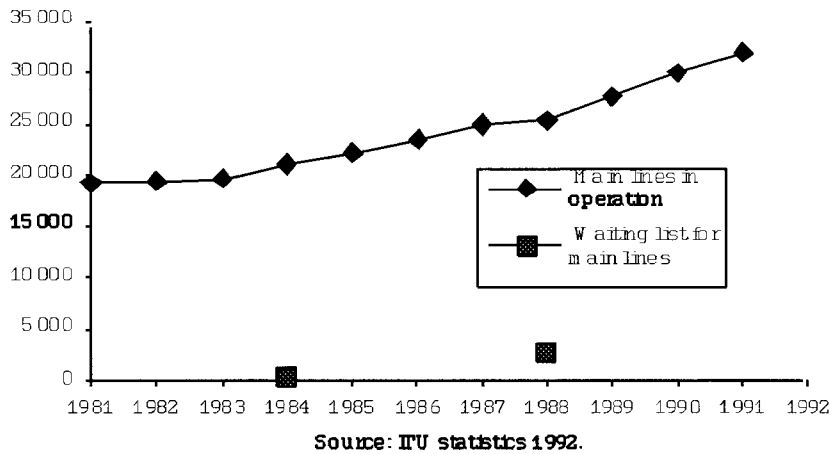
Source: AtlasEco (1995)

Table 2.1.2 Madagascar: Gross Domestic Product, 1988-92

	1988	1989	1990	1991	1992	1993
GDP (US\$ Bn)	2.339	2.47	2.71	2.25	2.72	2.8
GDP/capita (US\$)	215	220	230	200	180	220

Source: AtlasEco de Poche (1995)

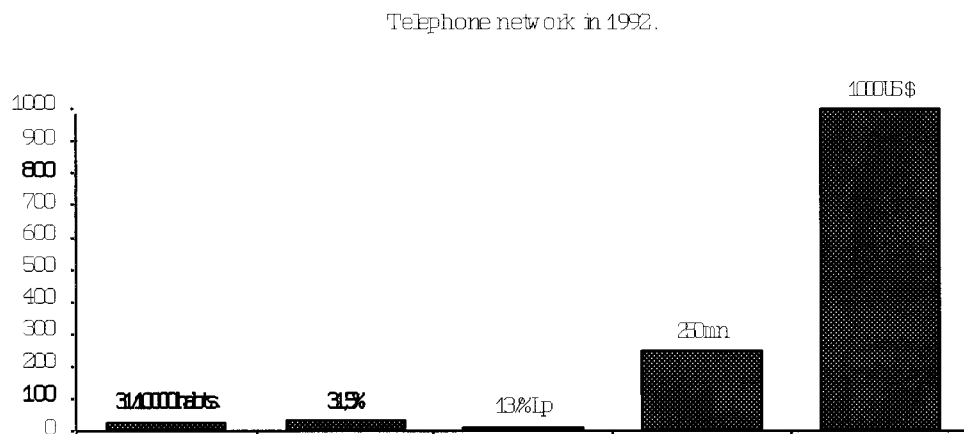
Figure 2.1.1 Madagascar: Telephone Coverage, 1981-92



From 1960 until the restructuring project of 1992, Madagascar's telecommunications sector had been under the direct control of the Ministry of Post and Telecommunications. Despite the rapid and continual global telecommunications changes of the past thirty years, Madagascar's regulatory framework has remained largely unchanged. Its telephone penetration rate was only 0.31

main line per one hundred inhabitants in 1992. With a call completion rate of less than 32 percent and a productivity ratio of 130 staff members per 1,000 main lines, the country's telecommunications administration has been an inefficient corporation, mainly because of the public service framework governing its organization. Within this framework, only 8 percent of public administration telephone bills were recovered by the PTT while the recovery rate for residential and business subscribers was 82 and 90 percent, respectively.

Figure 2.1.2 Madagascar: Telephone Network, 1992



Source: Manitarika M., Colloque Tunis, 1992 p1

Based on such poor performance, Madagascar's government did not hesitate in 1992 to characterize the country's telecommunications system, in contrast to its overall economy, as being in a poor state. It was therefore decided to undertake a complete reform of the sector's organization and ICEA, a French consulting group, was selected to lead feasibility studies sponsored by special loans from the French development fund (CFD). The first stage of these consulting studies ended in May 1992. Further studies were then ordered and meetings between PTT's management and personnel were held.

Following the political troubles of 1991, Madagascar finally elected a new parliament and a new president in the early days of 1993. The third republic was born and a real democratic political arena was guaranteed. Based on the new "constitution" adopted by referendum on October 31 1991, decrees reorganizing the telecommunications sector were issued on June 30, 1993. Madagascar Telecom, the country's new telecommunications operator, was created by decree No. 93-336 on June 23 of that year. On the basis of that decree, the government was empowered to sell up to 49 percent of the shares of the new operator to private investors.

The framework of the sector's reform encompassed the following points:

- a regulatory organ was created and carried by the

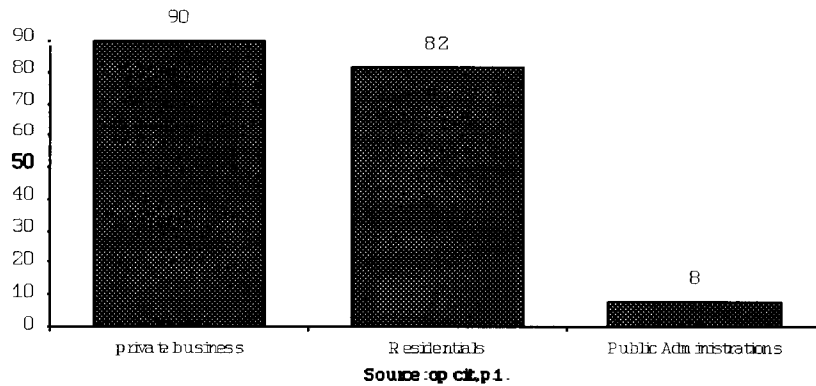
Ministry of Post and Telecommunications;

- an operating company (Madagascar Telecom) was created as a public company under private law registration;
- the scope of the services under the monopoly right provision was clearly outlined; and
- incentives toward encouraging new private entrants in the telecommunications sector were agreed upon.

As the new telecommunications operator, Madagascar Telecom took over the networks previously operated by the Ministry of Post and Telecommunications as well as the international gateways, which were operated by STIMAD, a joint subsidiary of France Câbles & Radio (FCR) and the local government. For the transitional period, it was determined that France Câbles & Radio should hold 33 percent of the shares of the new corporation's stock, with the remaining shares being controlled by the government. As a strategic and historic partner, FCR was also directly involved in the management of the corporation, mainly in the technical and planning activities of the public network. An additional step planned at the time consisted of "opening" the corporation's capital to other shareholders, the public, the workers, and even foreign investors.

Figure 2.1.3 Madagascar: Telephone Bill Recovery Rate,
1991

Telephone bills recovery rate in 1991



2.2 Gambia

Situated in West Africa and surrounded to the east and west by Senegal, Gambia has a land area of 11,295 square kilometers and a population estimated at 880,000 inhabitants. Its capital city, Banjul, has a population of roughly 50,000. Gambia was a British colony until 1965 when it gained political independence. It is ranked among the poorest countries in the world (see table 2.2.1 and 2.2.2.).

Figure 2.2.1 shows Gambia's telephone coverage between 1981 and 1992.

	Percentage of active population	Percentage of GDP
Agriculture	60	35
Mines	0	0
Industries	4	11
Services	36	54

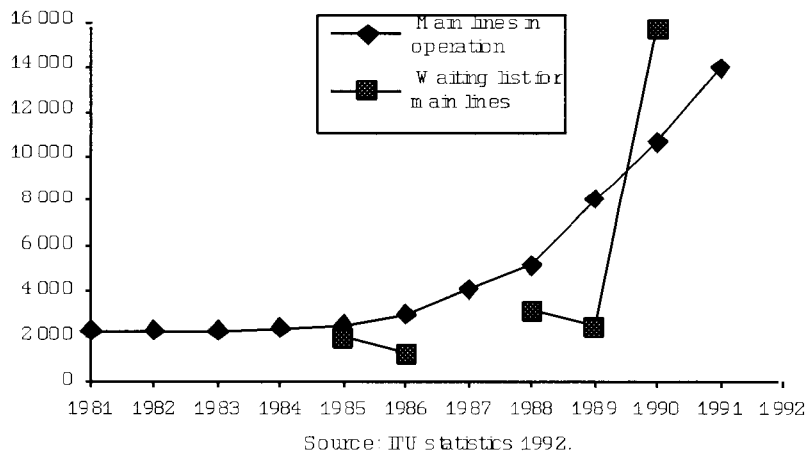
source: AtlasEco (1995)

Table 2.2.2 Gambia: Gross Domestic Product, 1988-90

	1988	1989	1990	1992	1993
GDP (US\$ Bn)	0.19	0.198	0.229	0.44	0.38
GDP/capita (US\$)	231	238	260	400	380

Source: AtlasEco (1995)

FIGURE 2.2.1 Gambia: Telephone Coverage, 1981-92



By 1892, Gambia was connected to the first international submarine telegraph cable when the African Direct Telegraph Cable Corporation built and operated its first West African telegraph cable. By 1965, the telephone network was obsolete and limited exclusively to the city of Banjul and its environs. In this period, Cable & Wireless Plc operated the international gateways on behalf of Her

Majesty's Post Office, and the Telecommunications Department within the Public Works Ministry operated the domestic network. The Telecommunications Department relied on heavy subsidies from the government. As a consequence (or even as a factor explaining the heavy subsidies), the telecommunications sector was directly controlled by the government. As a result, the management of the sector did not address the commercial needs, e.g., the revenues of teleservices were put at the disposal of the general treasury of the state. Moreover, any decision concerning procurements had to be approved by the finance minister. The sector's workers were hired or fired only by the cabinet of the president of the republic itself.

The state of Gambia's telecommunications sector in the postindependence era was characterized mainly by inefficiencies in management and organization. During this period, public administration lines have represented up to 32 percent of the main lines connected to the network.

The restructuring of the telecommunications sector began in 1979 with the assistance of the ITU. The first investigations conducted concluded that the previous division in the sector's organization should be banned, and it was thus decided that the Cable & Wireless subsidiary and the Telecommunications Department of the Public Works Ministry should be merged. In 1984, Gamtel was created as

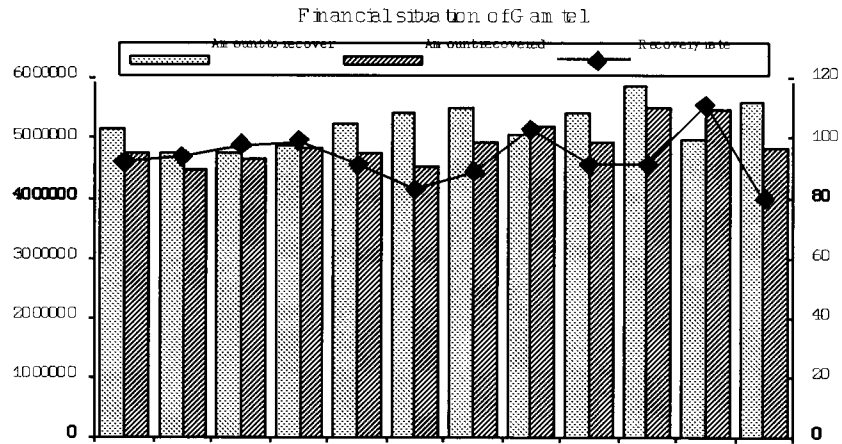
an autonomous public corporation with 1 percent of its stock held by local private investors.⁶ After this first stage, a national master plan of development for the telecommunications network was designed with the aim of quickly expanding and consequently modernizing the public network. A framework of "public service obligations" was also negotiated between the government and the management of the new corporation. This contract was signed by both parties in 1990. Although it was in fact an incomplete contract, it should be said that the Gambian government was generally satisfied with the performance realized by Gamtel throughout this period.

The "contrat de plan" improved the relationship between the government and Gamtel in many specific areas:

- because the corporation was to be genuinely autonomous, the government decided to appoint the general manager and three of its direct assistants on the shareholders board. Thus, half of the eight members of Gamtel's shareholders board belonged to the corporation's management;
- the general manager and his assistants were also directly responsible for the performance of the corporation, and the general manager was naturally to be fired if the corporation experienced poor performance. If the corporation's performance was positive, the general manager and his assistants as well as the personnel as a receive bonuses;

- Gamtel's revenues due to public administration traffic were lowered from 20 percent in 1985 to 9 percent in 1991;
- by reinforcing its marketing staff, Gamtel succeeded in improving its telephone bill recovery rate (see figure 2.2.2);

Figure 2.2.2 Gambia: Telephone Bill Recovery Rate



Source: Nje, op. cit, p 9.

- the restructuring of the telecommunications sector, which was followed by three modernization plans for the public network, also resulted in both macrolevel and microlevel economic benefits:

(a) from 1985 to 1992, the revenues from teleservices grew from 6 to 65 million French Francs (FF);

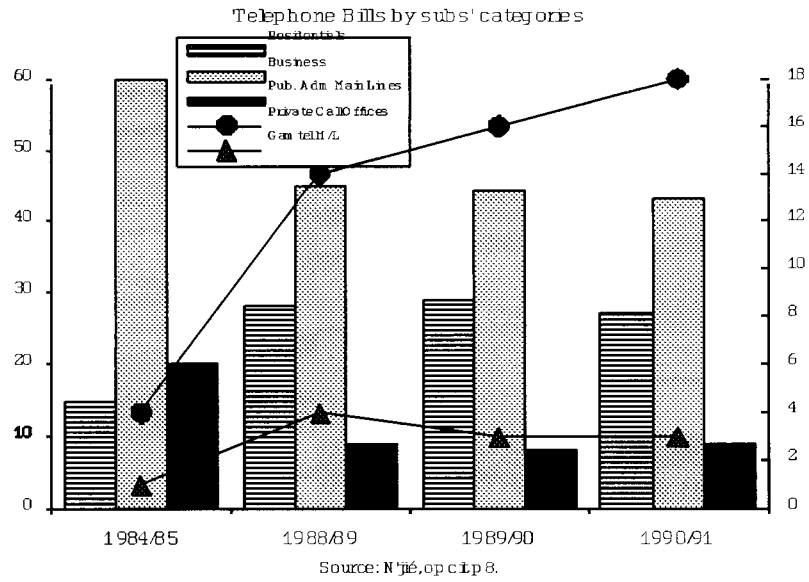
(b) due to telecommunications activities, the country improved its currency reserve from only 300,000 FF in 1985 to 18 million FF in 1992. Gamtel had a positive balance in international telecommunications accounts with other foreign administrations;

(c) the corporation was characterized by AT&T as having the best completion rate in Africa for international communications;

(d) the income of the corporation increased from 2.8 million FF in 1985 to 19 million in 1992, which made possible rates of return of 7 percent and 8 percent;

(e) as a public corporation Gamtel was not required to pay corporate income tax until 1994, but it was required to pay a 2 percent tax on its turnover. In 1992, Gamtel paid as much as 9 million FF to the government in franchise fees;

Figure 2.2.3 Gambia: Telephone Bills by Subcategories, 1984-91



2.3 Guinea

Guinea is situated on the West African coast with an area

of 248,857 square kilometer and a population of 5,950,000 inhabitants. After the famous "no" vote promoted by then Guinean leader Sekou Touré against General De Gaulle's proposal of "independence-association" for Guinea, the country acceded to its political independence in September 1958. Guinea later suffered through an economic embargo imposed by France as a result of this courageous initiative and since 1992 has been struggling to maintain a democratic political system. Economically speaking, Guinea has remained a very poor country, largely dependent on agricultural production (see tables 2.3.1 and 2.3.2).

Table 2.3.1 Guinea: Economic Activity, 1990

	Percentage of active population	Percentage of GDP
Agriculture	67	30
Mines	8	25
Industries	5	10
Mines	20	35

source: AtlasEco (1995)

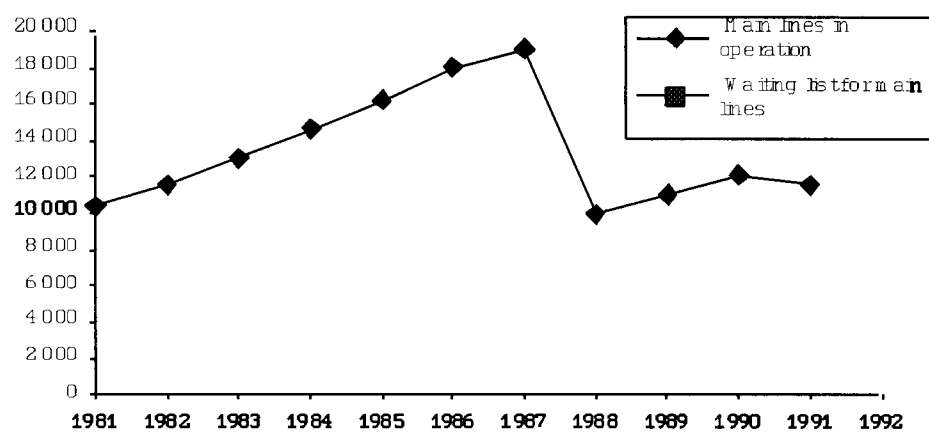
Table 2.3.2 Guinea: Gross Domestic Product, 1988-91

	1988	1989	1990	1992	1993

GDP (US\$ Bn)	2.44	2.55	2.76	3.1	3.37
GDP/capita (US\$)	419	460	480	510	530

Source: AtlasEco (1995)

Figure 2.3.1 Guinea: Telephone Coverage, 1981-92



Source: IPU statistics 1992.

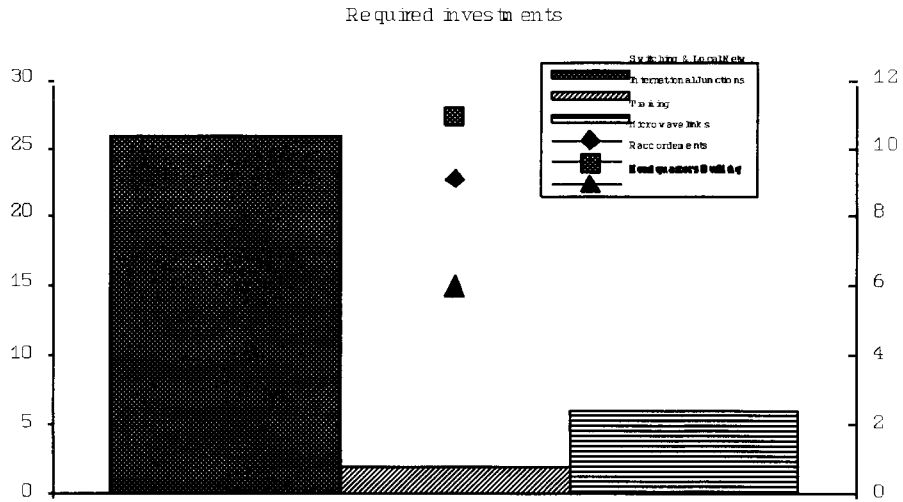
In 1960, barely two years after the country's political independence, Guinea's telephone network had no more than 2,400 subscribers. Thirty years later, this number had grown to only 10,000, down from 18,000 in 1987. This is an important fact in that it suggests that the system's negative growth may have been a consequence of the country's first structural adjustment plan. As a result of such performance, in 1991 the government began the restructuring of Guinea's telecommunications network. When this plan was decided, the World Bank and the IMF pointed out the consequences of the mismanagement of the telecommunications sector. As a result of such performance, in 1991 the government began the restructuring of Guinea's telecommunications network. This restructuration started through a broad recovery plan of telephone bills, explaining the important number of disconnections.

Beginning in 1985, the government decided to withdraw from all industrial sectors, leaving room for private investors to move in. The restructuring of the telecommunications sector, however, had to wait until 1989, when the creation of a public telecommunications corporation was envisaged that encompassed the telecommunications branch of the Ministry of PTT and separated telecommunications management from postal activities. After various technical and feasibility studies were performed with the consulting

assistance of Detecon, a German consulting group, and the financial assistance of the World Bank, the telecommunications reform took definitive shape and was made public in December 1991. It consisted of the following elements:

- the creation of an interministerial committee in charge of the telecommunications reform;
- the preparation of plans for the laws and decrees needed to further the reform process;
- the creation of a new regulation for personnel; and
- the preparation of the various financial documents also needed for reform (for example, opening accounts for the new corporation, evaluating assets, and allocating them to the postal branch and its telecommunications counterpart). The business plan of Sotelgui--the new telecommunications corporation--was also studied, arranging the new investments that were needed to improve both the network's penetration rate and its efficacy (see figure 2.3.2).

Figure 2.3.2 Guinea: Required Investment for Restructuring



Source: Pathé Baryetal, op.cit. aide-mémoire B.M.

The following additional steps were then taken to continue the reform of Guinea's telecommunications system:

- on 15 June 1992, an expert was recruited whose task was

to advise the government on the procedures surrounding the auction process out of which a strategic partner would be selected. At this point, the Guinean government decided to open the stock capital of Sotelgui to private investors, including even foreign investors. Since the government's aim was to foster the network's development and quickly improve the quality of service, it decided to bring in a strategic partner to provide the management know-how and finance required by the new investments;

- the auction process was then planned to begin on 15 January 1993, with the selection taking place no later than 31 December 1993. By the beginning of 1994, Sotelgui was to be privatized. As is quite common in such projects, however, the timetable could not be maintained, due most likely to technical problems and political events occurring in Guinea around this time. Finally, the privatization call for tender of Sotelgui, previously planned to take place in March 1994, was finally issued in November 1994 (see *Jeune Afrique Economie* no. 177, 1994), and expectations at the time were that the auction would be quite competitive. The final negotiations were scheduled to be carried from December 31 1994 to January 1995.

Meanwhile, the government continued its efforts toward improving the corporation's efficiency before the final stage of privatization. Toward this end, a management

contract was signed between the government and France Câbles & Radio (FCR), to be implemented between March 1993 and June 1994. Although the contract clearly stipulated that FCR could not participate in the auction process that was planned to begin at the implementation of the management contract, it became apparent that FCR was really interested in the auction process, and it subsequently began heavy lobbying for participation in the auction.

The end result of these stages of Guinea's telecommunications reform were the following:

- Sotelgui and ONP (Office National des Postes) commenced their operations on 1 March 1993 as public corporations with broad autonomy;

- the Ministry of PTT, which was previously involved in these activities, was relegated to the role of regulator. Consequently, in Guinea, both regulatory and political aspects of the telecommunications sector are under the same authority--a ministry of communications.

Finally, Law N° 92/106 of June 2, 1992 has given the right to the government to auction off, if necessary, production rights to private investors. Thus, the monopoly area was restricted to basic telephone service.

Sotelgui was created as a public joint stock company with a social capital of only 12. millions Guinean Francs. This amount was meanwhile, below the legal minimum required.

Two types of shares were issued:

- Type A shares were reserved to the government or to any other public administration;
- Type B shares should be auctioned off to a private investor.

Only Type A shares are freely transferable. This is a control rule which is supposed to protect the government from any rider strategy.

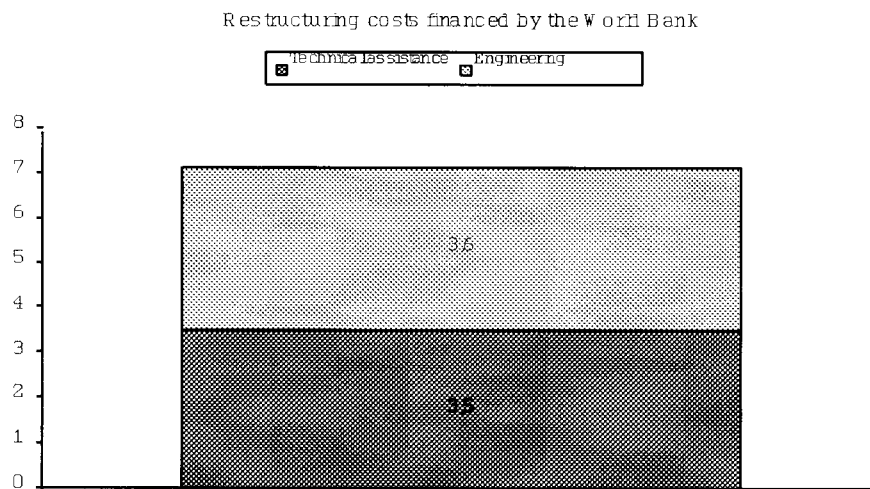
For the coming privatisation, the government has decided to auction 40% of its type A shares which therefore will be transformed in Type B. And further, the management of Sotelgui will be handed over to the private investor.

The franchise has a monopoly exclusivity of 10 years and may be extended.

Although it is difficult to determine what are the specific issues of the new regulation of Guinea's telecommunications sector after reform, as in other African countries, Guinea's new telecommunications laws deal with the telecommunications entity's obligations to provide public service and achieve service penetration rates and clearly specify the scope of the services to be provided within a monopoly framework. Some of the specific reforms of Guinea's new telecommunications apparatus (which were inspired and guided by experts from the World Bank) included:

- at the suggestion of the World Bank it was decided to reform the management of the government's Telecommunications Department before Sotelgui began operations. Toward this end, it was decided to implement an integrated management and information system and to restructure the tariffs. In addition, the functions of the general manager and five of his assistants (for finance, production, administration, human resources, and logistics and procurements) were to be assumed by expatriate staff;
- the government courageously decided to fire almost half of the staff of the former Telecommunications Department. A \$US2 million loan was provided by the World Bank for this purpose;
- with respect to existing liabilities, it was decided that the government should be responsible for the inherited debts. These debts were estimated at US\$4.5 million from realized telecommunications investment operations and US\$21 million from international communications between Guinea and foreign countries;
- Considering only the technical assistance and engineering studies required for the design of a development master plan, the reform and its associated costs were estimated at US\$7 million. These costs are shown in figure 2.3.3.

Figure 2.3.2 Guinea: Restructuring Costs Financed by the World Bank



Source: Paté Baryetal op.cit, p 4.

2.4 Sudan

With a total population of around 25,500,000 inhabitants in

1990, Sudan is located in the heart of Africa with a total area of about 2.5 square kilometers. The country's capital is Khartoum with a population of about 2,500,000. A former British colony, Sudan gained its political independence in 1956 and since then has suffered from political instability and frequent droughts. Sudan's economy is dominated by agricultural production (see table 2.4.1). As a result of its political instability, Sudan experienced a sharp decrease in its wealth in the 1980s and 1990s (see table 2.4.2).

Table 2.4.1 Sudan: Economic Activity, 1988

1993	Percentage of active population	Percentage of GDP
Agriculture	72	29
Mines	1	0
Industries	9	18
Services	18	53

Source: AtlasEco de Poche (1995)

Table 2.4.2 Sudan: Gross Domestic Product, 1988-90

	1988	1989	1990	1991	1992	1993

GDP (MUS\$)	8.82	8	4.8	4	5.5	6.4
GDP/capita(\$)	371	330	200	200	200	230

Source: AtlasEco de Poche (1995)

Sudan's low level of penetration for telephone services (less than 0.2 per one hundred inhabitants) and the sheer magnitude of the area in which communications are still needed suggest the degree to which the country will benefit from any additional telecommunications facilities. In response to these deficiencies, in the 1990s the Sudanese government began to consider changing the Sudan Telecommunications Public Corporation (STPC) into a public joint stock or private company. Some of the factors influencing this contemplated move included:

- the continual deterioration of the main infrastructures, equipment, and systems resulted in inefficient operation of the network and a very low grade of provided service and led to further deterioration of network performance and a noticeable increase in the discontent of subscribers;
- the inability of the STPC to raise the required funds, especially foreign funds, for additional equipment and the rehabilitation of the network. Moreover, almost all the working main lines are within Sudan's big towns and in most rural areas there is no telephone service at all. Thus,

Sudan's trunk network is in the form of a star with Karthoum as the principal node and microwave links connecting the outlying localities.

The main objectives of the formation of a public joint stock or private company are the following:

- provision of teleservices at a national level in order to truly promote Sudan's national development. As figure 2.4.1 shows, the number of subscribers between 1981 and 1992 has increased only slightly.

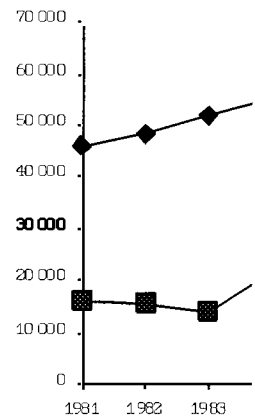


Figure 2.4.1 Sudan: Telephone Coverage, 1981-92

- creation of a corporation that is efficiently organized and managed, technically or financially, to foster the development of the telecommunications sector within the country;
- raising the necessary financing to cope with the needs of the modernization and the network's expansion plans;

To achieve the goal of reforming the existing telecommunications entity, in the 1990s the Sudanese government began negotiations with businessmen who might be willing to participate closely in a public joint stock or private company. It did not, however limit the scope of participation in the STPC's capital. The door was opened not only to private businessmen but to individual investors, providers of services, and even equipment manufacturers.

As of July 1992, the Sudanese government was pursuing the following steps toward eventual reform of the telecommunications entity:

- the founders of the new STPC were expected to meet to start the legal process of creating the new corporation and determining the number of shares to be issued and their attached value; and
- negotiations between the government and other shareholders were expected to determine the volume of shares that should be considered as parts of the STPC as well as deciding on the nature of the company (public joint stock, private), its

duties, and the franchise that may be granted to it.

To sum up, the situation in Sudan has followed the main issues discussed by Dr. Idriss Yousif (Deputy General Manager of STPC) in a book recently published by B.A. Kiplagat and M.C. Weiner (1994)⁷ The final issues of the reconstruction of STPC was the following: SUDATEL (Sudan Telecommunications) was created by the government to take on the provision of teleservices throughout the Sudan, mainly in the greatest urban area, leaving rural areas to the former state monopolist (STPC). To accompany this decision, the government also took some of the listed drastic measures:

- SUDATEL was given a monopoly franchise on international communications of 15 years;
 - SUDATEL was given a free hand to choose its personnel from the 700 STPC's staff. By February 1994, the new corporation staff was transferred to SUDATEL in 13 September 1994, except the domestic satellite system (SUDOSAT) which remained with STPC.
- A regulatory body was also created in November 1993 (The National Telecommunications Council) to take on the regulatory tasks previously carried out by STPC. Despite these courageous measures ordered by the government, the restructuration's experience of the telecommunications sector in Sudan, still suffering with a lot of shortcomings,

How rural areas equipment would be financed without the cross-subsidies from SUDATEL? What amount of SUDATEL's capital remains with the government? As I. Yousif (1994, p241)⁸ has clearly pointed out: "In spite of the vary many important incentives given to the company, shareholders' initial contributions (about US \$100.00 per founder share) did not meet expectations, Nevertheless, it's anticipated that the company is fully in control, the shares will be open to the publish (up to 25% of the capital); it's expected that the company will attract more capital".

2.5 Congo

With an area of 342,000 square kilometers and a population of 2,310,000 inhabitants, Congo has been independent since August 1960. Since independence Congo's political system has been socialist with a Marxist ruling party. After the sovereign national conference in 1991, the country adopted a new constitution and the political system is now quite liberal. A new parliament and head of state were elected in 1992. Most of Congo's population is engaged in agricultural activities, and the country is ranked among the world's middle-income nations (see tables 2.5.1 and 2.5.2).

Table 2.5.1 Congo: Economic Activity, 1989

1993	Percentage of active population	Percentage of GDP
Agriculture	34	10
Mines	5	28
Industries	20	10
Services	41	52

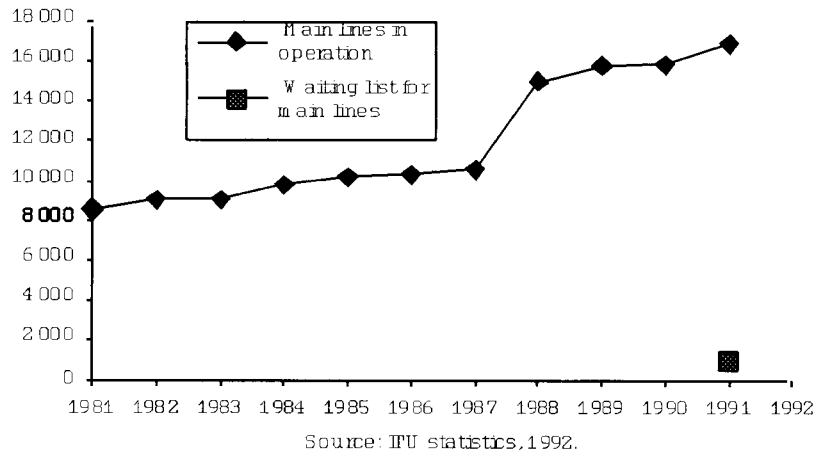
Source: AtlasEco (1995)

Table 2.5.2 Congo: Gross Domestic Product, 1988-91

	1988	1989	1990	1991	1992	1993
GDP (US\$ Bn)	1.99	2	2.29	2.5	2.82	3
GDP/capita (US\$)	962	960	1010	1060	1170	1230

Source: AtlasEco (1995)

Figure 2.5.1 Congo: Telephone Coverage, 1981-92



Created by Law No. 9/64 in June 1964, Congo's Office National des Postes et Télécommunications (ONPT) was charged, as a public corporation, with the construction and operation of the country's public telecommunications network, with a total monopoly franchise. In the years that followed, however, the ONPT's functional structure has frequently been changed to cope with its public service missions. By February 1990, the office was facing

significant financial burdens arising primarily from the postal branch. Thus, when the sovereign national conference met in Brazzaville in 1991, its participants examined the ONPT's treasury burdens and finally urged the transitional government to undertake a complete restructuring of the sector, with the privatization of the telecommunications branch receiving particular endorsement.

Following this first political initiative, the management of the ONPT organized a meeting with its personnel and the labor unions to elaborate the best scheme for the restructuring of the corporation. From these debates, it was recommended that:

- the professional expertise or know-how of the telecommunications personnel in general and of the marketing area in particular be reinforced;
- the planning activities be reinforced through better training of the planning staff and a complete reorganization of the ONPT's planning process; and
- the relationship between the postal and telecommunications branches be clarified.

Although these first steps toward reform were announced in 1992, the major political turmoil Congo experienced from 1991 to early 1994, paralyzed the country and has made it extremely difficult to proceed with any serious reform.

2.6 Central Africa Republic

Central African Republic is a landlocked nation with an area of 622,984 square kilometers and a population of 2,688,426. Its capital city, Bangui, has a population of roughly 500,000. Independent since August 1960, Central African Republic has an economy that is dominated by agricultural production and is ranked among the world's poorest countries (see tables 2.6.1 and 2.6.2).

Table 2.6.1 Central African Republic: Economic Activity, 1993

1993	Percentage of active population	Percentage of GDP
Agriculture	66	35
Mines	3	20
Industries	9	10
Services	22	35

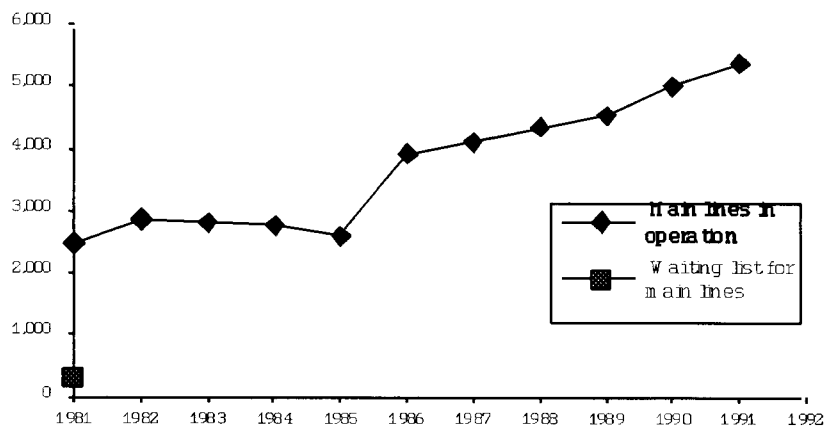
Source: AtlasEco 1995

Table 2.6.2 Central African Republic: Gross Domestic Product, 1988-91

	1988	1989	1990	1991	1992	1993
GDP (US\$Bn)	1.09	1.1	1.3	1.25	1.15	1.04
GDP/capita (US\$)	382	369	440	410	360	320

Source: AtlasEco 1995

Figure 2.6.1 Central African Republic: Telephone Coverage, 1981-92



Source: ITU statistics, 1992.

Created by Law No. 69/050 in August 1969, the Office Centrafricain des Postes et Télécommunications (OCPT), as a state corporation, was charged with the construction and the operation of Central African Republic's public telecommunications network. The OCPT was also made responsible for the operation of some international links with neighboring countries while the main international routes (to Paris, Douala, and Abidjan) were operated through a franchise by France Câbles & Radio (FCR).

In March 1979, the government decided to concede the operation of all the international routes to FCR⁹, which then created the société centrafricaine des télécommunications internationales (Socati) through a joint venture with the government. In March 1982, following the deterioration of the domestic network and under pressure from some international funding organizations, the government decided to create a department of telecommunications within the OCPT completely autonomous from the department of postal affairs. This formula lasted until 1990 but the results limited or even worsened the country's telecommunications system. Finally, in 1990, the government decided to merge Socati and the telecommunications branch of OCPT into one corporation named Société centrafricaine des télécommunications (Socatel). Since Socati was a mixed-economy corporation owned partially

by FCR and at the time of the merger the government could not buy back FCR's shares in Socati, it was decided that FCR would also hold shares in the new corporation--with a cap on its ownership of 40 percent ownership designed. A contract between the government and its partner was then issued, which dealt with the functional structure to be given the new corporation; the duties of the new corporation; the development plan for the network; the personnel plan for dealing with the staff inherited from the defunct corporations; the opening of balance sheets for Socatel; and the closing of balance sheets for the telecommunications branch of the OCPT.

The telecommunications development plan intended for the first time to build up a national "integrated" network, with switching nodes around the country side and modern transmission links to interconnect them. We must point out the fact that, since the sixties, the telephone network was exclusively limited to the capital (Bangui). Most of the country was poorly connected to the telephone network, mainly through obsolete radiotelephone links.

As from 1990, it was decided to open the automatic service in the main representative towns and, an international gateway was also to be constructed in Bangui. It's amazing to note that, up to the 1990's plan, Central African

subscribers were technically handled for their international calls, as deported subscribers of the French network.

2.7 Benin

Benin is situated on the West African coast sharing common borders with Nigeria and Togo. It has an area of 112,622 square kilometers and a population in 1991 of 4,900,000 inhabitants. Benin's capital city is Cotonou, with a population of 400,000. Benin achieved political independence in August 1960 and since then has experienced several political regimes. Its last Marxist regime was abandoned in 1990, and in 1991 the sovereign national conference enacted several major changes in the country's political system. In 1990, a new constitution was adopted, and a new parliament was elected in March 1991. Economically, Benin is a land of both traditional and modern agriculture. It is ranked among the world's least developed countries (see table 2.7.1).

	Percentage of active population	Percentage of GDP
Agriculture	56	36
Mines	3	4
Industries	6	12

Services 35 48

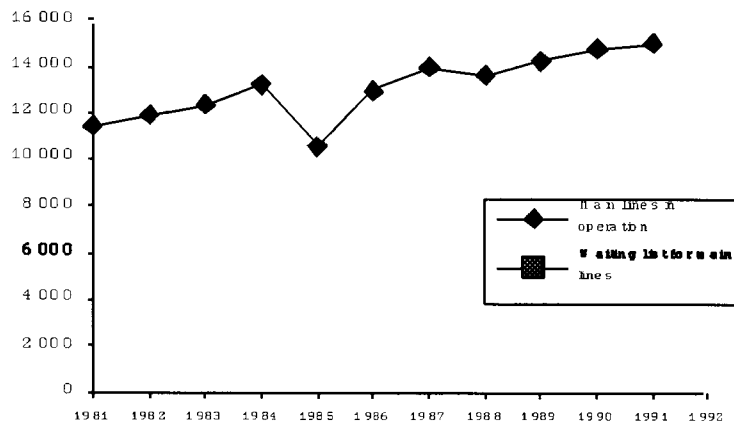
source: AtlasEco 1995.

Table 2.7.2 Benin: Gross Domestic Product, 1988-91

	1988	1989	1990	1991	1992	1993
GDP (US \$ Bn)	1.73	1.64	1.98	2.08	2.25	2.39
GDP/capita (US\$)	389	356	421	426	456	460

Source: AtlasEco 1995

Figure 2.7.1 Benin: Telephone Coverage, 1981-92



Source: ITU statistics 1992.

Since December 1959, Benin's telecommunications sector has been organized as a state monopoly. The Office des Postes et Télécommunications (OPT) was created to act within a franchise conceded by the government as a public monopoly. Even though it was granted legal autonomy, however, the OPT has in fact had only very limited independence:

- the government treasury was mixed or merged with the public treasury;
- the OPT was under the direct control of the Finance Ministry and other political organs;
 - even the OPT's procurements were heavily regulated by the Ministry of Finance;
 - the OPT's employees were civil servants, and their careers were managed by the Civil Servants Ministry rather than by OPT;
- up until 1985, all OPT's managers (almost at every level) were appointed by the minister of communications, and the general manager could not even appoint his own assistants.

A former assistant general manager of OPT described the entity's autonomy" like this: "only the financial cost of employees was at the direct and sole expense of the office" (Noumba, 1994). But even the OPT's financial autonomy was a largely artificial one. Being what is known in French as an "établissement public à caractère

administratif," the OPT was not given a legal statute appropriate to its missions. As a result, the telecommunications network suffered from mismanagement, lack of appropriate maintenance, and lack of investment.

The first attempt at the reform of Benin's telecommunications entity was ordered by the OPT's management, which decided on a rehabilitation plan for the public network in 1985 with the assistance of the ITU. The ITU later generalized this plan throughout Africa as NPIM (National Plan of Improved Maintenance, designed to improve the efficacy of the network through tangible action (such as maintenance training of personnel, replacement of equipment, and maintenance organization and planning). Following the NPIM, a development master plan was designed and submitted to the banking community for financial research. Given the bottlenecks plaguing Benin's existing telecommunications system, the experts concluded that the improvement of the country's telephone penetration rate or even the digitalization of the network could only be achieved through a small revolution. Designing the development master plan, the experts recommended:

- an institutional reform of the telecommunications environment in Benin. Toward this end, new laws and regulations were required to spur the development of the sector as a whole; and

- the transformation of the OPT into a public corporation with real autonomy and the power to change its previous bureaucratic culture into a market-oriented culture;

A factor influencing Benin's telecommunications reform efforts was the stipulation by the World Bank and other financial organizations assisting the OPT that beginning in 1985 all future loans to the telecommunications sector had to be conditioned on three criteria:

- a real and significant reform of the OPT's financial structure, in particular its billing system;
- modernization of the OPT's management organization through a new accounting system and marketing reorganization; and
- a precise timetable leading to the separation of the telecommunications branch from the postal branch.

By the beginning of 1991, after Benin had successfully changed its political system and later elected a new government and president, the restructuring of the telecommunications sector was included within a global reform of the public sector. It was decided that the first stage of the reform of the telecommunications sector would be the financial reform required by the lending organizations. By May 1993, the first stage had been completed with positive results: the telephone bill recovery rate was improved from 50 percent in the previous year to 90 percent, and the corporation treasury was separated from the

public treasury. Finally, beginning in 1989, the general manager of OPT could appoint his own assistants.

Although the future stages of the telecommunications reform in Benin were still unclear in the mid-1990s, it is likely that, following the success of the country's democratization process, a general framework clarifying the scope and contents of the monopoly sector will be issued before too long and the OPT divestiture into two different and autonomous corporations will be agreed upon as well.

2.8 Mali

Mali has a land area of 1,240,000 square kilometers and a population of 8,300,000 inhabitants, 950,000 of which reside in its capital city of Bamako. Formerly a French colony named Soudan, Mali gained political independence in August 1960 after the failure of a federal union with Senegal. The country's economic activities are mainly based on agriculture and cattle breeding. Mali is ranked among the poorest countries in the world (see table 2.8.1).

	Percentage of active population	Percentage of GDP
Agriculture	73	44
Mines	1	2

Industries	6	11
Services	20	43

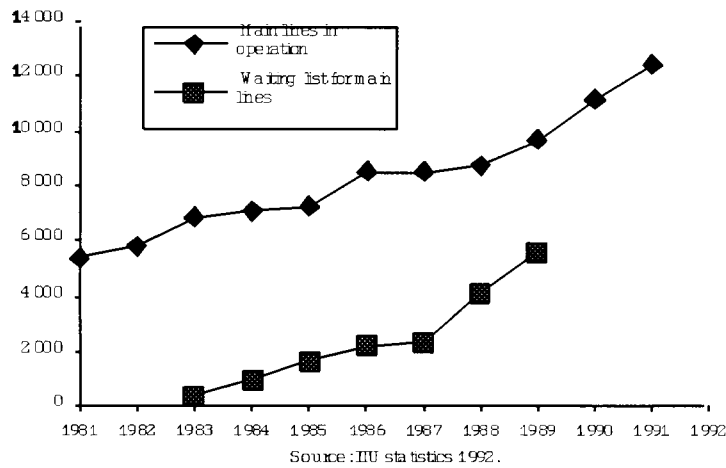
source: AtlasEco 1995.

Table 2.8.2 Mali: Gross Domestic Product, 1988-91

	1988	1989	1990	1991	1992	1993
GDP (US\$ Bn)	1.91	2.05	2.45	2.42	2.6	2.6
GDP/capita (US\$)	237	249	302	295	268	260

Source: AtlasEco 1995

Figure 2.8.1 Mali: Telephone Coverage, 1981-92



The restructuring of Mali's telecommunications sector was planned within the general context of a reduction in the scope of all state-owned enterprises. In June 1982, the office des Postes et télécommunications (OPT) was facing heavy financial burdens. The postal branch was unable to provide the reimbursement of various fund deposits or money orders. Out of this predicament began the direct involvement of the IMF in Mali's economic adjustment program. When the situation worsened it was decided to separate the postal and telecommunications activities into two different corporations and to undertake a broad financial restructuring of the Postal Saving Bank.

By 1986 the World Bank had entered the telecommunications restructuring arena, strongly recommending to Mali's government that the OPT's telecommunications activities be merged with the activities of the international operator TIM, a joint subsidiary of France Câbles & Radio (FCR) and the Mali government. OPT's postal activities would therefore have to be divested.

After major negotiations, the final point of agreement was reached in 1988. It stipulated:

- the merger of TIM and the telecommunications branch of the OPT into a joint stock company later named Sotelma (January 1989); and
- the merger of the postal services and their financial

associates in order to create a public corporation.

As commonly occurs in such situations, further negotiation was required on such issues as the liabilities of the former OPT; the identification, evaluation, and reallocation of OPT's assets between the old branches; the state of the personnel inherited from both OPT and TIM; and the opening balance sheets of the new corporations.

Taking into account the complexity of these tasks, it was agreed that although the newly created corporations (Sotelma and ONP [Office National des Postes]) were created by Mali's government in September 1989, they decided to postpone the beginning of operations until January 1, 1990. By July 1992 the financial studies ordered in 1990 had still not become available due to major difficulties encountered in the auditing of some historic balance sheets and profit and loss statements. In the area of the reform's social aspects, however, it was decided that all the various categories of personnel to be integrated in Sotelma would preserve their previous status.

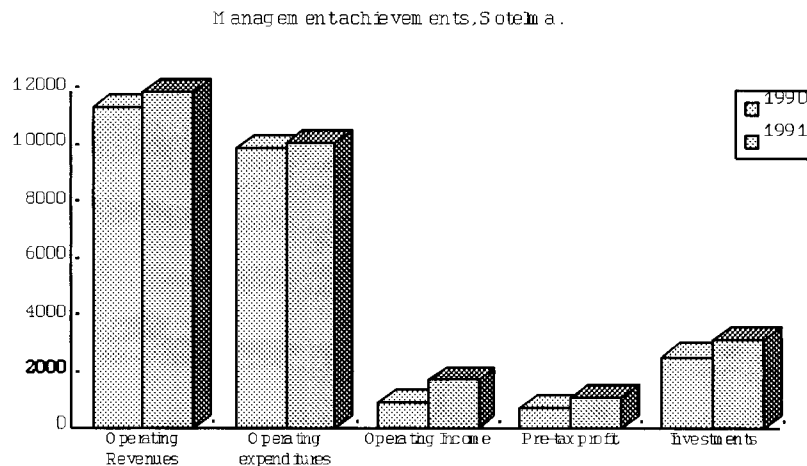
Although the restructuring of Mali's post and telecommunications had to be global, the government decided

- to sign management contracts with the two new corporations Sotelma and ONP, the first being signed with the management of Sotelma in January 1991; and
- to induce ONP and Sotelma to negotiate a compensation

mechanism to cover their mutual services. For this purpose, the two signed a first agreement in December 1990.

By 1992, Sotelma was a partially private corporation, insofar as a portion of its shares were held by FCR, and its financial performance was improving (see figure 2.8.2).

Figure 2.8.2 Mali: Management Achievements of Sotelma, 1990-91



Source: Lettre d'information, Jeune Afrique N° 1692, juin 1993.

2.9 Burkina Faso

Burkina Faso is a West African nation with an area of 274,200 square kilometers and a population of 9,230,000. Its capital city is Ouagadougou (630,000 inhabitants). Originally part of the territory that comprised Côte d'Ivoire, (see chapter #), in 1924 Burkina Faso, known then as Upper Volta, became one of the last colonial states in West Africa to be created by the French colonial administration. Along with other French colonies, the country gained its political independence in 1960 and in 1984 changed its name from Upper Volta to Burkina Faso. The country's economy is based mainly on agriculture although its productivity is hampered by its desert regions. Burkina Faso is ranked among the world's poorest countries (see table 2.9.1).

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1993	Percentage of active population	Percentage of GDP
Agriculture	75	38
Mines	2	5
Industries	10	15
Services	13	42

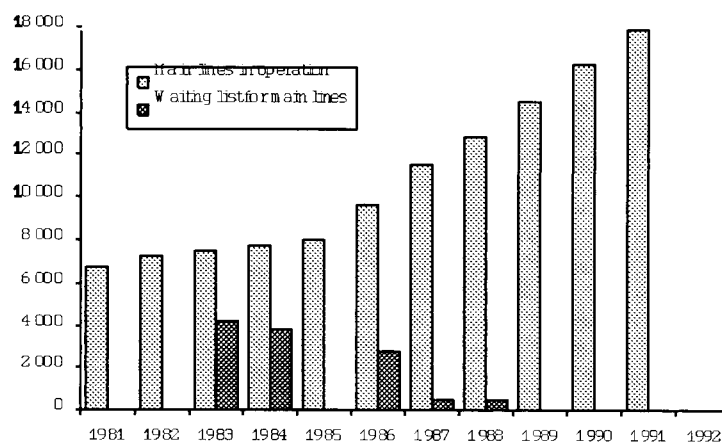
source: AtlasEco 1995.

Table 2.9.2 Burkina Faso: Gross Domestic Product, 1988-91

	1988	1989	1990	1991	1992	1993
GDP (US\$ Bn)	2.65	2.66	3.3	3.3	3.6	3.6
GDP/capita (US\$)	312	304	370	360	380	370

Source: AtlasEco 1995

Figure 2.9.1 Burkina Faso: Telephone Coverage, 1981-92



Source: ITU Statistics 1992.

The country's post and telecommunications sector has evolved continuously during the postindependence period. From 1960 to 1968, the sector was wholly operated by the Ministry of PTT. In June 1968, the Office of Post and Telecommunications (OPT) was created as a public corporation with theoretical autonomy. From the OPT's inception, the management of the post and telecommunications activities were separate, with two individual management systems being developed.

The divestiture of the OPT encountered a positive political will in 1987 when the government's decision to improve the efficiency of its public sector brought the relations between the government and the public corporations under reexamination. Major incentives for increasing the responsibilities of the managers of the public corporations were decided upon. At the same time, the government also decided to withdraw from its previous role as subsidy provider of the different public corporations.

To achieve the objectives of the government's reorganization scheme, an institutional reform was needed. In 1985, the first steps toward the achievement of this reform were taken when a restructuring committee of the OPT was created. The committee envisaged two alternatives: the first aimed at the creation of two different corporations, in charge of postal and telecommunications activities,

respectively. The second aimed at creating three different public corporations: one for mailing activities, another for the postal banking activities, and a third for telecommunications.

The second alternative was rejected and, February 19, 1987, the government decided to create two new state-owned enterprises: ONATEL (office national des télécommunications) and ONP (office national des Postes). With this decision, both companies began operations and began confronting the classic management issues, such as allocating common resources (manpower, buildings, cars) and the like. For all such issues, pragmatism was the only source of inspiration: manpower, for example, was allocated on the basis of initial training or even the most recent field experience; technical buildings were totally allocated to ONATEL while post offices were allocated to ONP; cars were allocated on the principle of the mode of procurement; and so on. Because of their technical nature, some common services like computer units or car repair units were placed under the responsibility of the ONATEL.

What steps Burkina Faso would next take in the restructuring of its telecommunications sector were still unclear by the mid-1990s.

2.10 Senegal

Senegal is a West African nation with an area of 196,102 square kilometers and a population of 7,300,000 inhabitants. Its capital city is Dakar with a population of 2,500,000. Independent in August 1960, Senegal has been operating under a pluralist system of democracy since 1980. The country's economy is oriented toward agricultural production and has suffered serious difficulties since the early 1980s, which have led to successive economic adjustment plans. Senegal is ranked among the world's low-income countries (see table 2.10.1).

1993	Percentage of active population	Percentage of GDP
Agriculture	70	22
Mines	3	2
Industries	12	19
Services	15	57

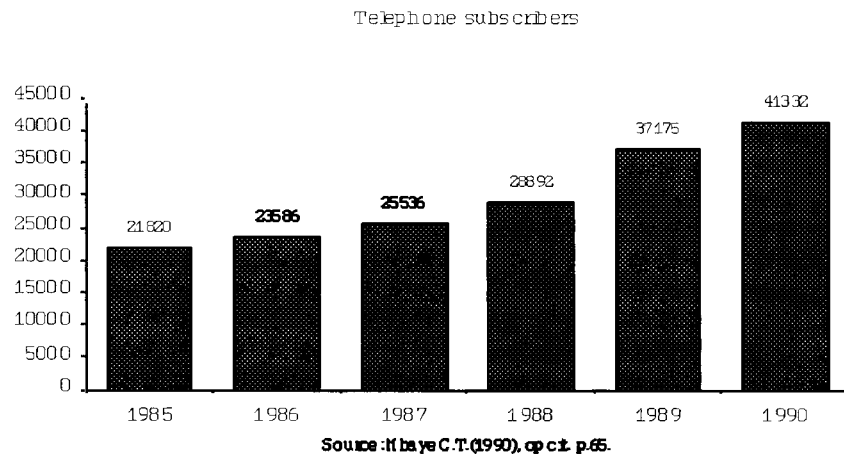
source: AtlasEco 1995.

Table 2.10.2 Senegal: Gross Domestic Product, 1988-91

	1988	1989	1990	1991	1992	1993
GDP (US\$Bn)	4.74	4.41	4.8	4.85	5.4	5.13
GDP/capita (US\$)	660	628	665	650	700	650

Source: AtlasEco 1995.

Figure 2.10.1 Senegal: Telephone Subscribers, 1985-90



Until 1985, Senegal s telecommunications were operated by two state-owned corporations:

- Tele Senegal, for the international gateways. At its inception, this corporation was jointly owned by the government and France Câbles & Radio (FCR). It has a staff

of around 300; and

- the OPT (office des Postes télécommunications), the domestic network operator with a staff of 1,700.

This organization, however, turned out to be inefficient and led to discriminated allocation of resources in favor of the international network, which benefited from up-to-date equipment while the domestic network suffered greatly from a lack of investment and maintenance. As Mbaye (1990) has pointed out, "it was because of this particular situation that the government finally decided a complete reform of the telecommunications sector, putting the sector forward to the rank of development priorities during the 7th development plan."

Before proceeding any further with the sector's reform, the government induced the management of the OPT to organize a general brainstorming meeting with its personnel. During this meeting, the following issues were publicly debated by the participants:

- the modalities that should affect the reform were examined so as to anticipate eventual shortcomings;
- the regulation framework was updated to adapt it to the changes occurring in the sector;
- the transfer of assets and liabilities between the former state-owned corporations and the new corporation was examined;

- the allocation of staff between the new corporation and OPT or even Tele Senegal was debated strenuously; and
- government arrears (telephone bills) due to OPT were treated.

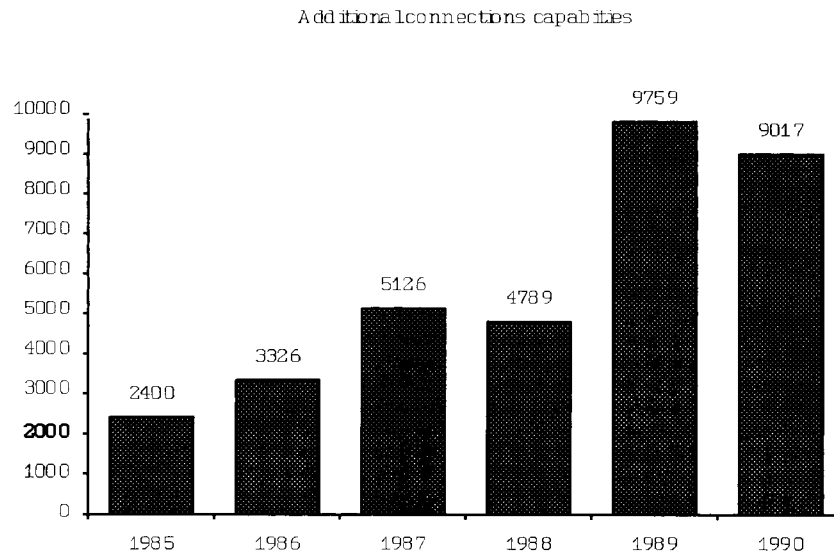
Finally, a general framework dealing with the duties and rights of the new operator was written down. The framework included objectives assigned to the new operator in the area of service--for example, the provision of service in the rural areas. All the issues listed above were broadly discussed, and on October 1, 1985, the government created a new operator Sonatel (société nationale des télécommunications). As a public corporation under private law registration, Sonatel took over the former activities of Tele Senegal and OPT. A first contract plan was finalized between the shareholder (the government) and the management of Sonatel for the period 1986 to 1989. This contract stipulated:

- the improvements to be achieved in the area of projects planning (i.e., shortening of delays and so on);
- the synchronization of the development of the domestic network with the international network;
- the suppression of taxes on imported telecommunications equipment. (Thus, the government decided to no longer subsidize the telecommunications sector.)

Since its birth in 1985, Sonatel has registered

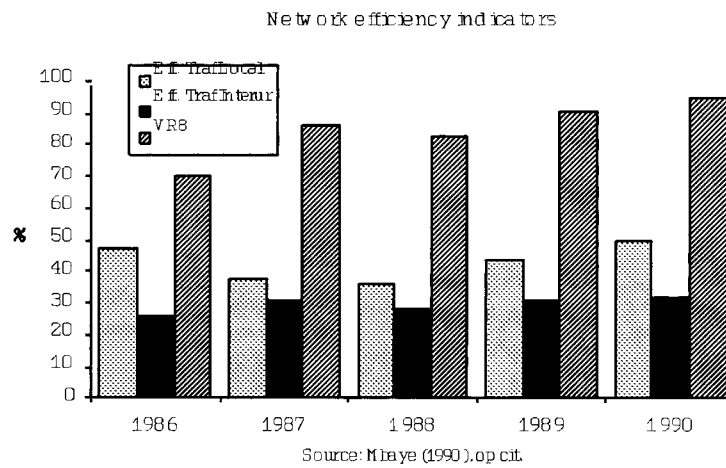
several major achievements in the areas of additional connection capabilities, network efficiency, and management efficiency (see figures 2.10.2, 2.10.3, 2.10.4).

Figure 2.10.2 Senegal: Additional Connection Capabilities, 1985-90



Source: M. Baye C.T. (1990), ATDC Handbook, p.64.

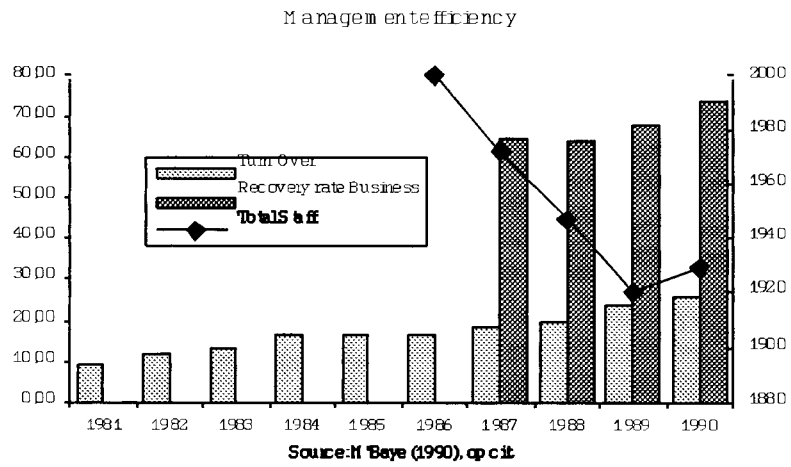
Figure 2.10.3 Senegal: Network Efficiency Indicators, 1986-90



Notes: Eff. Traf Local = Local traffic efficiency rate; Eff. Traf Interub = Long

distance traffic efficiency rate; VR8 =
Efficiency repair time (less than 8 days).

Figure 2.10.4 Senegal: Management Efficiency, 1981-90



2.11 Cameroon

Cameroon is a West African nation with an area of 475,000 square kilometers and a population of 12,200,000. Its capital is its second largest city, Yaounde, with a population of 700,000 inhabitants. Eastern Cameroon acceded to its political independence in January 1960, and in October 1961, through a referendum organized by the United Nations, Western Cameroon, which was then administered by the United Kingdom joined with Eastern Cameroon to form a federal state. In May 1972, Cameroon transformed itself into the United Republic of Cameroon and then to the Republic of Cameroon in 1984.

Cameroon's economy is dominated by agricultural production (see table 2.11.1). Since Cameroon started oil production in the early days of the 1980s, however, the importance of the country's industrial sector has continued to grow.

Table 2.11.1 Cameroon: Economic Activity, 1990

1993	Percentage of active population	Percentage of GDP
Agriculture	63	24
Mines	2	12
Industries	10	19

Services	25	45
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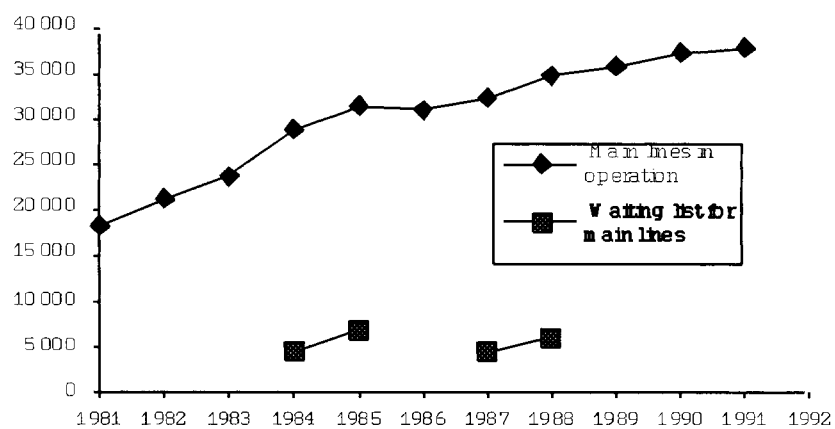
Source: AtlasEco 1995

Table 2.11.2 Cameroon: Gross Domestic Product, 1988-91

	1988	1989	1990	1991	1992	1992
GDP (US\$ Bn)	12.56	10.73	12	12.2	11	9.9
GDP/capita (US\$)	1120	928	1090	1000	880	792

Source: AtlasEco 1995

Figure 2.11.1 Cameroon: Telephone Coverage, 1981-92



Source: ITU statistics 1992.

For most of the postindependence era, Cameroon's telecommunications sector has been characterized by a quite unusual stability. While most African countries created "Offices des Postes et télécommunications" during the early 1970s, Cameroon--and a few other countries like Madagascar, Algeria, and Tunisia (see chapter #)--kept its telecommunications activities under the direct control of the ministry of PTT. The case of Cameroon is interesting because although the government has always refused to allow more autonomy to the post and telecommunications sector because it was considered strategic, Cameroon's various governments always advanced the sector's reform during this period. More recently, under pressures exerted by the IMF and the World Bank, the government initiated another reform of the PTT.

The public telecommunications network in Cameroon has an expanded star-shaped organization in which the microwave links play an important role, particularly with respect to long distance communications. The main components of the network are:

- forty-two local switching exchanges installed in thirty-four localities or towns, connecting 52.000 subscribers in 1992¹⁰. Ten digital exchanges (Siemens EWSD) are installed in Yaoundé (the capital city) and Douala (the most important town). The total connection capability of these TEN

exchanges is 135,000 main lines (90,000 main lines terminate in the digital exchanges). The thirty-two remaining exchanges are electromechanical analog exchanges (Crossbar CP400 provided by Alcatel);

- two national transit exchanges, both digital (Siemens EWSD), are installed in Yaoundé and Douala with 9,157 junction connection capabilities;
- two international gateways in Douala (a digital Alcatel MT20) and Yaoundé (an analog electromechanical Pentaconta system that was to be replaced in the mid-1990s by a digital system);
- more than 5,000 kilometers of microwave links throughout the country. Although it remains mainly analog, Cameroon's transmission network was being digitalized in the mid-1990s, with the digitalization of the Yaounde-Douala-Bafoussam-Yaoundé loop (with a TRT 3*34 Mbit/s system) already completed;
- in Yaoundé and Douala, the links between the digital exchanges are fiber optic;
- a mobile telephone system (GSM) was put into service in 1992, covering the highways between Douala, Yaoundé, and Bafoussam. This mobile network is also used to connect rural areas along the highways via public call offices. Generally speaking, approximately one hundred rural areas had been equipped with telephones (TRT system IRT 1500 or 2000) in

the early 1990s;

- the public network also provides a telex service and, of course, an x-25 packet-switching data network¹¹. These services are operated under a franchise agreement by Intelcam;

Between 1985 and 1992, the government invested about 89 billion F Cfa¹² in the telecommunications sector. Up to 49 percent of this amount is estimated to have been financed internally. These efforts led to the following improvements: the digitalization rate of the switching network is now estimated to be 69 percent of the main lines equipped and only 6 percent of the transmission links. Furthermore, 76 percent of the cable local network is between five and fifteen years old; 60 percent of the switching exchanges are sixteen years old; and 85 percent of the transmission equipment is less than five years old. Clearly then, compared to common standards, Cameroon's telecommunications network is not constrained by the obsolescence of its equipment. The inefficiencies the network has experienced (in 1990, 41 percent of the expressed demand was satisfied while only 15 percent of the potential demand was satisfied) are therefore consequences of mismanagement or even shortcomings in the institutional framework of the sector.

Historically, the telecommunications sector in Cameroon has been characterized by two main

telecommunications operators: one in charge of the domestic network (the telecommunications branch of the Ministry of PTT) and the other in charge of the international network (Société des télécommunications internationales du Cameroun or Intelcam). As a joint stock corporation, Intelcam has been owned since its inception by the government (60 percent of the shares) and France Câbles & Radio (FCR) (40 percent of the shares). Under a franchise conceded by the government to FCR, Intelcam has been operating the international gateways since 1960. This dichotomous situation led to the unbalanced development of the whole telecommunications network: the international gateways were well maintained and modern while the domestic network suffered from the bureaucratic-style management that characterizes any ministry. The sector's obvious need for reform was consistently pointed to, even by the various media, but the government failed to decide on action.

One of the sector's major reform attempts began in 1978, arising out of the poor state of maintenance on the domestic network. Technical feasibility studies financed by a World Bank loan were carried out but as usual the government seemed unconvinced. Finally, a rehabilitation plan was decided on and carried out between 1978 and 1981 with the assistance of the ITU. Following implementation of the plan, revenues from telephone traffic increased 30

percent.

These first concrete actions convinced the government to decide on further steps. Thus, a project to transform the Ministry of PTT into an "office des PTT" was issued. Technical studies were carried out for this purpose, but by 1983 the government had failed to decide. In 1988, the government decided to broaden the autonomy of the PTT while keeping the whole sector within the framework of a ministry. This was the "budget annexe" award of December 1988 adopted by a law of parliament. With this form of autonomy, the telecommunications sector was for the first time empowered to finance its procurements through its direct revenues. But like any ministry, the PTT was under the direct control of the Ministry of Finance for its procurements and the control of the Civil Servants Ministry for the management of its personnel. The PTT's investments were capitalized like the other public investments of the government.

The budget annexe also had some positive aspects. For example, it made it possible to motivate the sector's personnel directly through incentive schemes financed by the ministry's own budget. The production units could also receive more logistics and could budget directly with regard to their planned objectives.

After the first four years of the budget annexe, the government came to realize that further reforms were

necessary, primarily because of the performances achieved by the PTT management through the first stage of restructuring and, secondly, because the structural economic adjustment plan proposed the restructuring of most of the public sector. In 1992, a concrete project for restructuring the PTT was again submitted to the government by the PTT s management. The restructuring consisted of the creation of two public corporations: Cameroon Telecommunications (Camtel) and Postes du Cameroon.

Figure 2.11.2 Cameroon: Priority to the Telecom Sector

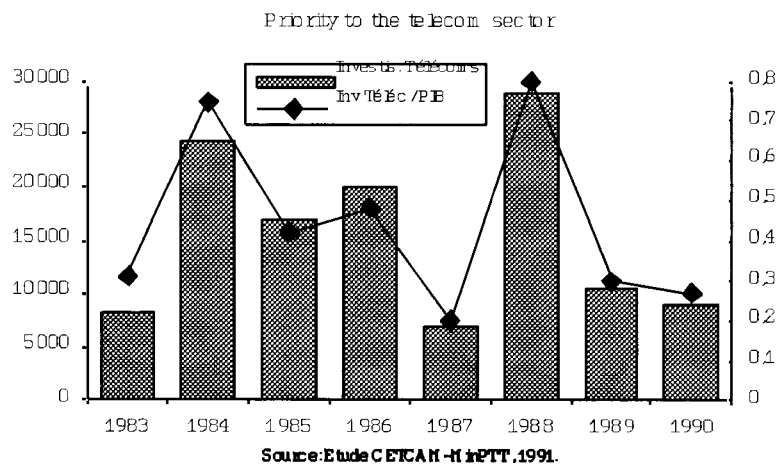
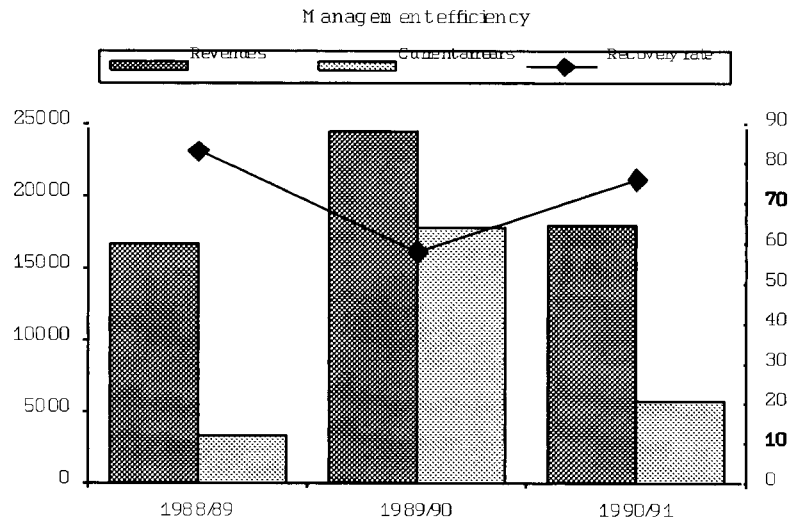


Figure 2.11.3 Cameroon: Management Efficiency



Camtel as a public corporation was supposed to take over all the telecommunications activities conducted by the Ministry

and Intelcam, while Postes du Cameroon was to be a public corporation created to carry out all the postal activities and associated financial matters.

In 1991 Cameroon began experiencing a protracted period of political instability that weakened the government and all the economic restructuring programs. When these troubles subside, Cameroon will likely make a final decision on the appropriate shape of its telecommunications sector.

3.0 Conclusion

If it is widely accepted that most of Africa's restructuring exercises completed or underway in the mid-1990s were induced by broader, economywide stabilization adjustment programs, it's less clear whether there is a general tendency toward the privatization of Africa's telecommunications. In quite a number of African countries, the restructuring of the telecommunications sector has sought to achieve three main objectives:

- strengthen policy making by formulating clear sector goals and coherent action programs;
- introduce institutional reforms by separating the policy-making, regulatory, operating and, service delivery functions; and
- expand the investment and financing capacity of the telecommunications sector or economy as a whole.

Although the first two issues have been handled with some success by Africa's various restructuring efforts, the third issue remains a very complex one in the African context. In Africa, important shortcomings are limiting the scope of telecommunications restructuring:

- the decline in Africa's standard of living since 1980 and the continuous deterioration of the continent's economies in the 1980s and 1990s (emphasized by the devaluation of the franc Cfa in January 1994) has been a serious impediment to

any telecommunications restructuring plans;

- the continuous political instability experienced by many African nations has a genuine weakening effect on restructuring plans.

In such a social and economic context, African governments have to extend the basic telecommunications services throughout their countries, improve efficiency in sector institutions and operations, and introduce new technologies. This is a huge and complex task. It is therefore not surprising that while telecommunications restructuring has started almost everywhere, it remains incomplete almost everywhere as well! Africa's telecommunications networks remain in their infancy stage and require important resources (financial, managerial, human resources-related, technological, and so on) to cope with their development needs.

Just as important, as liberalization proceeds in Africa, two main issues require particular attention. First, the regulation process has to be handled efficiently by Africa's governments. To do this, governments need highly qualified staff to deal with the legal, economic, and technical issues involved in regulation. The gap between the continent's restructuring programs and the level of training of qualified staff dedicated to dealing with regulation issues is alarming. Unfortunately, until

recently, the restructuring of telecommunications in Africa has emphasized network operation and services delivery over personnel training.

Second, teleservices users must play a larger role in restructuring. Although business users of telecommunications services clearly need corporate networks with transborder facilities, inducing the emergence of a regional or local dimension in Africa's telecommunications restructuring efforts is just as important. As this chapter's case studies demonstrate, the problems facing African countries have remained the same just as the players involved in restructuring programs have been unchanged. An expanded role on the part of user's lobbying groups in Africa's restructuring schemes can help to bridge the "missing link" in the continent's telecommunications development efforts.

Appendix

Table 1

	Density 91	Main Lines 91	Growth rate 80's	Total Staff	Reven. MUS\$	Expend MUS\$
Benin	0.31	15011	2.6	1280	25,8	22,9
Burkina Faso	0.19	18000	10,8	988	22,8	15,3
Cameroon	0.31	38000	6,6	2173	68,7	
Central AF Rep	0.17	5358	7.2	357	11,3	5,8
Congo	0.72	16905	7,3	1008	69	36,7
Gambia	1.59	14000	22,2	685	12,6	9,2
Guinea	0.19	11553	0	1090	26,7	
Madagascar	0.28	32000	5,7	2381	10,4	
Mali	0.13	12464	8,8	1555	39,5	
Senegal	0.64	48469	10,7	1913	111,2	54,7
Sudan	0.25	63600	3,1	8019		

a) The following countries staff statistics are dated 1988: Cameroon, B
Madagascar, Mali (1990).

b) Revenues of the following countries are dated:
* 1988: Burkina Faso, Cameroon, Madagascar.
* 1990: Mali, Guinea.

Table 2

	Invt 91	MUS\$ Av	Invt (00's)	Invt/M.L (\$)	% GFCF	Density 2000	Extra M-L	'00Invt (91-00) M\$
Benin	0.9		2	4366	0.3	0.29	65010	95
Burkina Faso	6		8.5	7950	1	0.39	116820	175
Cameroon	1.8		15.4	13621	0.1	0.42	161800	240
Central AF Rep	4.6		4.6	13465	3.3	0.25	40050	60
Congo	1.5		2.4	1352	0.3	1.01	63180	90
Gambia	7.3		6.8	2301	10.8	7.46	57100	85
Guinea						0.15	75810	110
Madagascar						0.37	143590	215
Mali	5.6		5.6	11045	1.4	0.2	131300	195
Senegal	93		52.2	6251	12.9	1.25	193410	290
Sudan						0.25	332590	495

a) The following countries data on investments⁹¹ are dated 1988: Cameroon, B Faso, Mali

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- Congo, 7 pages.
- Côte d'Ivoire, 9 pages.
- Mali, 10 pages.
- République Centrafricaine, 5 pages.

1. For example, President Abdou Diouf of Senegal said in a 1991

speech: "telecommunications more than any other communications infrastructure should naturally remain under State control because of the following concerns: national security, national sovereignty, strategy." The speech was delivered while inaugurating a PANAFTEL microwave line.

2.The project of privatising RwandaTel (Rwanda's public operator) has been dropped out since the civil war. At the time of writing, no further informations have been published on this issue by the new government

3.Bottom - Up approaches to private sector development may involve one or more of the following: new concessions to independent telephone companies, new cellular radio licenses, revenue sharing contracts for new privately built facilities, local foreign joint ventures and build transfer (B-T) schemes for transmission or local exchange facilities.

4.Most PTOs discriminate between residential and business subscribers. Because business subscribers can still register as residential subscribers, however, such discrimination is not necessarily effective.

5.This is partly a paradox, but one may not forget in most developing countries as in developed countries as well, the procurement contracts have obligations to produce locally some of the materials being manufactured. As production facilities are

localised because of procurement obligations, the host country can then save foreign currencies and may be, reduce its commercial balance. In Africa, Tunisia has started an interesting experience in this area. This country has trained an important number of well qualified engineers which are now working with foreign countries subsidiaries, in specialised software production for telephone switching exchanges. At the time of writing this chapter, We have not been acknowledged of any legal framework rewarding products manufactured within the continent. Though, this issue should be put forward in future, we think that the difficulties encountered in this field are due to the lack of coordination between African states, even at the sub - regional level (UDEAC or UMOA).

6. It's interesting to noting that at the time of its creation, Gamtel s released capital amounted to only US\$2.

7.B.A. Kiplagat & M.C. Weiner (eds),Telecommunications and development in Africa,Telecommunications Foundation of Africa (TFA),IOPRESS, Netherlands.

8.See Chapter 28 in B.A. Kiplagat & M.C. Wiener (1994).

9.This decision was not specific to Central African Republic. Most French speaking countries in Africa conceded their international networks to France Câbles & Radio.

10.The waiting list was estimated at around 9.000 demands.

11.The principal users of the X. 25 packet network are: Banks and Insurance Corporations, some public administrations and Airlines companies.

12.Franc CFA is the currency in usage in 14 french speaking countries in subsaharan Africa. Namely: Cameroon, Côte d'Ivoire, Senegal, Gabon, Congo, Central Africa Republic, Niger, Benin, Togo, Mali, Tchad, Comores, Equatorial Guinea, Burkina Faso. After the January's 1994 devaluation, 1 French Franc is equivalent to 100 Francs CFA.